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REPORT RESUMES

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THE IDENTIFICATION AND DEVELOPMENT OF TALENT IN HETEROGENEOUSLY GROUPED STUDENTS IN A GENERAL EDUCATION PROGRAM AT THE SECONDARY SCHOOL LEVEL.
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DESCRIPTORS- *TALENT IDENTIFICATION, *TALENT DEVELOPMENT, *HETEROGENEOUS GROUPING, *SECONDARY SCHOOL STUDENTS, FUNDAMENTAL CONCEPTS, GENERAL HIGH SCHOOLS, STUDENT ATTITUDES, STUDENT BEHAVIOR, *STUDENT DEVELOPMENT, COLUMBUS, OHIO

AN INVESTIGATION WAS MADE TO DEVELOP A CONCEPTUAL MODEL OF TALENT IN ADOLESCENCE AND TO IDENTIFY "INDICES OF TALENT" THAT MANIFEST THEMSELVES IN STUDENT BEHAVIOR TO PROVIDE FOR INDIVIDUAL TALENT IDENTIFICATION AND DEVELOPMENT WITHIN THE HETEROGENEOULSY GROUPED SECONDARY SCHOOL CLASSROOM. THE DESIGN OF THE STUDY WAS OF A DEVELOPMENTAL NATURE. THE PROJECT CENTERED ON APPROXIMATELY 175 STUDENTS IN GRADES 7 THROUGH 12, ENROLLED IN A LABORATORY SCHOOL ON THE OHIO STATE UNIVERSITY CAMPUS. THERE WERE FOUR STEPS IN THE DEVELOPMENT OF THE PRELIMINARY TALENT MODEL, INCLUDING EXPLORATORY INTERVIEWS WITH UNIVERSITY FACULTY, INTERDISCIPLINARY DISCUSSION GROUP MEETINGS, RECORDS EXAMINATIONS OF SEVERAL UNUSUALLY TALENTED SUBJECTS, AND A SYNTHESIS OF ALL PERTINENT DATA AND RESEARCH MATERIALS. STEPS WERE THEN TAKEN TO VALIDATE THE PRELIMINARY MODEL. THE PROCEDURE REQUIRED SOLICITATION AND ANALYSIS OF PROFESSIONAL FACULTY OPINIONS, SOME ACTUAL CLASSROOM OBSERVATIONS, AND A COMPREHENSIVE SURVEY AND REVIEW OF RELATED LITERATURE. THE PROJECT STAFF THEN PRODUCED A REVISED MODEL OF TALENT AND A TALENT INDEX, BASED UPON A DETAILED DESCRIPTION OF "TALENTED BEHAVIOR" AS A FUNCTION OF THE OVERALL INDIVIDUAL PERSONALITY. A FOLLOW-UP PROGRAM WAS RECOMMENDED TO DEVELOP A CURRICULUM USING THE CONCEPTUAL INFORMATION DEFINED BY THE INITIAL STUDY. (JH)

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THE IDENTIFICATION AND DEVELOPMENT OF TALENT IN HETEROGENEOUSLY-GROUPED STUDENTS IN A GENERAL EDUCATION PROGRAM AT THE SECONDARY SCHOOL LEVEL

A Research Project Sponsored Jointly
by
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Final Report
June 30, 1959

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THE RESEARCH REPORTED HEREIN WAS PERFORMED PURSUANT TO A CONTRACT WITH THE UNITED STATES OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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FOREWORD

The major purposes of this study being carried on in The Ohio State University School are (1) to refine our concept of talent in adolescence and (2) to identify "indices of talent" that manifest themselves in the behavior of students as they are involved in the general education program, grades 7-12. A second phase of this study (building on the research which is specified in the present contract) will involve the planning and development of a curriculum, grades 7-12, designed to further the identification and development of those talents conceptualized in the present study.

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The problem is defined in Part I of this report. Part II describes briefly the procedures used in developing a tentative model of talent. The procedures discussed are: (1) exploratory interviews with members of the Ohio State University faculty; (2) exploratory interdisciplinary discussions; (3) a study of the records of several unusually talented students; and, (4) a synthesis of pertinent research. The tentative model is presented also.

In Part III the procedures used in validating the tentative model are described. The reactions of the University School faculty and of other members of the Ohio State University faculty who had expressed an interest in this phase of the study, observations of unusually talented students in an eighth grade core class, and a continued study of the literature suggested that the model was acceptable as a model of maturity but that there was considerable doubt as to whether it was also acceptable as a model of talent.

The procedures used in revising the tentative model are described in Part IV. These include: (1) a more comprehensive survey of the literature--drawing not only upon the literature dealing with talent at the conceptual level but also at the level of possible categories into which talents fall as well as indications of talent; (2) small group discussions involving the University School faculty; and, (3) analysis of the descriptions of the behavior of unusually talented individuals provided by authorities in the various disciplines (members of the Ohio State University faculty).

The revised model of talent is presented in Part V. It is a description of "talented behavior" and as such represents an attempt to come to grips with how the talented individual behaves in the situations in which his talent is manifest. Illustrations of talent in adolescence are included in Part VI. And, the Appendices include copies of the project proposal and the questionnaire sent to authorities in the various disciplines.

The writer, on behalf of the project directors, wishes to acknowledge the help and encouragement given by the many members of the Ohio State University faculty who have had a part in this undertaking. Particular mention is due Ross L. Mooney and the staff of the University School who so generously contributed their time and energies during the course of the project. Finally, the writer wishes to express her appreciation to Donald Steer, David Campbell, and Dale Knapp for their able assistance in the research and to Ann Darst for her efficient typing and handling of the work in the office.

Elsie J. Alberty

TABLE OF CONTENTS

Part I	The Problem	1
Part II	Procedures in Developing a Tentative Model of Talent	6
Part III	Validating the Tentative Model of Talent	20
Part IV	Reexamining the Tentative Model of Talent	45
Part V	The Revised Model	174
Part VI	Talent in Adolescence--Selected Illustrations	181
	Appendix A	203
	Appendix B	209

PART I

THE PROBLEM[1]

One of the major trends in secondary school curriculum development seems to be toward more extensive provisions for individual differences among students, particularly at the upper levels of ability and talent. This probably is to be expected since providing for individual differences among students has always been the concern of American schools. In recent years,. however, the increase in enrollment, which in turn has caused an increase in class size and in the degree of heterogeneity in the school population, has served to focus even more attention on this problem. More important even than the increased enrollment is the present trained manpower situation. The shortage of trained scientists and engineers has led many of our leaders to demand that the high schools do a better job of identifying and training talented youth - especially in the fields of science and mathematics. A variety of plans have been suggested and considerable research and experimentation carried on, but how to provide for the talented is still a vital issue.

Basic to the problem of providing for the talented is the development of a more adequate concept of talent. Who are the talented? What is the "life style" of talented persons? Is there such a thing as specific talent, e.g., in mathematics, science, leadership, or is talent general? How can talent be identified? How early can it be recognized? What is the relationship between the presence of talent and social climate? Questions such as these must be answered if we are to plan and execute high-school curricula which will further the identification and development of talent.

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[1] A copy of the project proposal is included in Appendix A.

The Problem

How can unusual talent be identified and developed in a general education program at the secondary-school level, a program in which students are grouped heterogeneously?

Major Objectives

1. To develop a conceptual model of talent in adolescence.
2. To identify "indices of talent" that manifest themselves in the behavior of students as they are involved in the general education program, grades 7-12, a program in which students are grouped heterogeneously.

A second phase of this study (building on the research which is specified in the present contract) will involve the planning and execution of a curriculum, grades 7-12, designed to further the identification and development of those talents conceptualized in the present study.

Major Hypothesis

Talent can be identified and developed in a general education program in which students are grouped heterogenously.

Some of the more specific questions to be investigated in this phase of the study are:

1. What is the nature of talent?

   Is talent specific, e.g., is there such a thing as talent in science, mathematics, leadership, etc., or is talent general?

2. What are the different kinds of talent that might be released?

   Can talents best be categorized in terms of the major disciplines, in terms of intellectual, useful, or aesthetic facility, or in terms of some other set of categories?

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3. Can indices of talent be identified?

Is it possible to describe indices of talent in terms of a set of categories? What basic factors, if any, underlie the categories into which talents fall? For example, does a creative artist have anything in common with a scientist? What is the life style of talented individuals?

4. How can talent be identified at the high-school level?

How early can talent be identified? What are some clues that might help teachers in the identification of talent?

Assumptions

1. An analysis of the common needs, problems, and interests of young people growing up in our democratic culture provides a sound basis upon which to organize a general education program.

Here, general education refers to that part of the curriculum required of all on the ground that it provides for the understandings, skills, and appreciations needed by all citizens in a democratic society. Special needs are provided for through the special-interest (elective) program.

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2. Problem areas, the broad areas of living in which young people usually have problems, provide the most effective organization for the general education program.

The curriculum which is basic for all should consist of learning activities that are organized without regard to conventional subject-matter lines. If the major problems of youth are to be dealt with realistically, the traditional subject-matter approach to general education must give way to an approach based on broad units of work which know no subject boundaries.

3. A wide variety of individual differences can be provided for within the regular class groups.

Students should be grouped heterogeneously in the general education program. Democratic values can be fostered at the same time that the uniqueness of the individual is being developed.

Setting of the Study

This study was carried on in The University School, the laboratory school on the Ohio State University campus. The school has a continuous fourteen-year program, enrolling students from four-year kindergarten through the twelfth grade. The current total enrollment is about 375. In this study as indicated earlier, we have been concerned primarily with the identification and development of talent at the secondary level. The present enrollment in grades 7-12 is approximately 175 students, with single sections in grades 7-10 and double sections in grades 11 and 12. The median I.Q. is 119, the range from 79-160 on the Stanford-Binet. These students seem to have a wider range of differing talents than seems to be typical of most high schools. Well over ninety percent of the graduates go to college.

In considering the setting, some attention should, of course, be given to the curriculum. One of the unique features of the University School curriculum is the core program. This program has evolved in the University School as the staff has attempted to develop the most effective general education program possible for boys and girls in grades seven through twelve. Here, general education refers to that part of the curriculum required of all on the ground that it provides for the understandings, skills, and appreciations needed by all citizens in a democratic society. It should be noted that at the present time the core program does *not* comprise the *total* general education program at the secondary level. Physical education is scheduled daily for all students in grades seven through twelve. Mathematics is required of all seventh-, eighth-, and ninth-grade students. A year of American History is a prerequisite for graduation.

Special interests of students are provided for through the electives program. In grades seven, eight, and nine the students have an arts elective. Students in the tenth, eleventh, and twelfth grades have an opportunity to choose four electives each year.

The core program is organized in terms of problem areas, broad preplanned areas of living in which young people usually have problems. Learning units drawn from these areas are developed cooperatively in the classroom by teacher and pupils. Subject matter from all pertinent fields of knowledge is drawn upon to illimunate, clarify, and provide data for solving these pertinent common problems of living.

The problem areas from which learning units are drawn are as follows:

1. School Living
2. Healthful Living
3. Communication
4. Government
5. Producer-Consumer Economics
6. Conservation of Resources
7. Values and Beliefs
8. Human Behavior (Understanding Self and Others)
9. Conflicting Ideologies
10. Education
11. Occupations (Selection of and Preparation For)
12. A Developing Cultural Heritage
13. Social Relationships in a Rapidly Changing Society
14. Living in the Atomic Age

In addition to the development of a learning unit, the core program has responsibility for providing for activities related to group living--immediate problems of group living and matters of class business--and for the development of individual reading and writing programs. In the junior high school from one-half to two-thirds of the day is set aside for this part of the curriculum; in the senior high school, about one-third of the day. The remaining time is given over to instruction in special-interest areas.

In planning the study the project staff, of course, tried to capitalize on the resources at hand. In addition to an interesting student population and a situation in which significant beginnings had already been made in the study of child growth and development and in the field of curriculum research, we were fortunate to have the assistance of a highly trained professional staff in the University School and excellent consultant resources in the Ohio State University. In the section which follows the procedures used in developing a tentative model of talent are described. Procedures used in validating and revising the model are described in subsequent sections.

PART II

PROCEDURES USED IN DEVELOPING A TENTATIVE MODEL OF TALENT

The first step in this study was the development of a tentative hypothetical model of talent. The procedures used in developing the preliminary draft of the model were: (1) exploratory interviews with members of The Ohio State University faculty; (2) exploratory interdisciplinary discussions; (3) a study of the records of several unusually talented University School students; and, (4) a synthesis of pertinent research. In the discussion which follows each of these procedures is described briefly. The tentative model is included also.

Exploratory Interviews

During the Winter and Spring Quarters, 1958, approximately fifty members of The Ohio State University faculty (from the Departments of Mathematics, Chemistry, Physics and Astronomy, History, Political Science, Sociology and Anthropology, Economics, Geography, English, Education, Psychology, Physical Education, The University School, and the Schools of Fine and Applied Arts and Music) were interviewed informally concerning their views of talent--its identification and development. A very brief summation of their comments and reactions follows:

What is talent? It was generally agreed that talent means many things to many people. An overwhelming majority of those interviewed (approximately 90 per cent), however, defined talent as outstanding ability in some area(s) of human activity coupled with productivity.

Here, the distinction between potential talent and effective (manifest) talent was emphasized. Several persons stressed that too much attention is focused on the product rather than on the person. Several others suggested that talent is really synonymous with creativity. And, in two cases talent was defined simply as a mature, well-integrated way of coming at life.

Is talent specific or is it general? There appeared to be an almost even division of opinion on this question. Those taking the position that talent is specific tended to emphasize that talent is an innate quality and that there are a number of specific talents which can be described as either academic or artistic in character. Also, it was suggested that what sometimes seems to be a more general talent is actually a number of rather specific talents. On the other hand, those taking the position that talent is general gave a great deal of attention to the importance of such factors as environment and social climate. Talent was not viewed as an innate something though it was agreed that native ability is quite important. Rather, talent was viewed as a dynamic thing which grows and develops as the environment fosters it.

What are some indices of talent? It was generally agreed that it would be possible and perhaps not too difficult to describe in detail how talent manifests itself in various areas. And, in a number of cases such descriptions were given. Also, it was agreed that there are a number of basic factors which underlie the areas in which talent manifests itself. The most-mentioned basic factors were general intelligence, intellectual curiosity, creativity, motivation, interest and drive. Other factors mentioned by two or more persons were self-discipline, concentration, organization, persistence, alertness, "fearlessness", perception, clarity of purpose, identification with the task, a sense of discrimination, ability to define and test hypotheses, "sensitive intuition", and tolerance of ambiguity.

Exploratory Discussions

In the Spring Quarter, 1958, three interdisciplinary discussion groups explored the nature of talent and its identification. The groups had seven members each, and they were set up in such a way so as to involve several University School staff members as well as authorities from various of the disciplines. Each of the group members had previously been interviewed and had expressed an interest in such exploratory discussions. Among the participants were members of The Ohio State University faculty from the Departments of Mathematics, Physics and Astronomy, Chemistry, Sociology and Anthropology, English, Psychology, The University School and the Schools of Music and Fine and Applied Arts. The University School participants included teachers of mathematics, science, social studies, art, language arts, and core. The project directors and the Coordinator of Research for the College of Education also participated in the discussions.

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Prior to the discussions each participant received the following materials: a brief description of the project; a brief summary of the exploratory interviews; and, a proposed agenda. The major items on the proposed agenda are listed below:

1. Nature of Talent

   Is talent specific, e.g. is there such a thing as talent in science, mathematics, leadership, or is talent general?

2. Categorization of Talent

   Can talent best be categorized in terms of the major disciplines, in terms of intellectual, practical, or esthetic facility, or in terms of some other set of categories?

3. Indices of Talent

   Is it possible to describe indices of talent in terms of a set of categories?

4. Identification of Talent

   How can talent be identified at the high-school level?

Each of the small group discussions was tape recorded and analyzed. A few selected passages are quoted in the following summary of the major points discussed.

On defining talent

> An overwhelming majority of those interviewed defined talent as outstanding ability in some area(s) of human activity coupled with productivity. --Discussion leader reporting on exploratory interviews.

> Instead of trying to define talent as a certain constellation, whether it be a talent for writing or criticism or so on, instead of trying to get our pictures or images clear and then looking for children where we find these images reflected in their behavior, we might think of talent as that which is most valuable in any child. The approach is one in which you look at each child with all the sense that you can and you try to figure out the Gestalt, the unique pattern of value that lay in the constitution of the child and you can move out from it... take the child to be the primary reality and then look for the unique combinations...of talent within this child that in this world would be most valuable.
>
> --Coordinator of Research

> I think that it is very much easier to describe how talent manifests itself than it is to pinpoint what it really is. I think you recognize it in people. Just exactly to define what it is is probably very subtle.
>
> --Professor of Physics

...There is another point I see in all this...it seems to me you're suggesting a danger of any single conception of talent. ...It may well be, I'm convinced, that we're not dealing with a single complex but a multiple series of systems each of which would go best within a particular condition.
--Professor of Fine Arts

...What strikes me as interesting are the people who somehow don't fit in the position they seem to be. One of the most creative and productive members of this class is at the very bottom of the I.Q. scale. ...I'm not sure to what extent we're distinguishing... talent from intelligence.
--Language Arts Teacher

I have a hunch that we will not define talent. I think we are going to have to accept this as an undefined term and talk about characteristics of talent and how it manifests itself.
--Mathematics Teacher

Could one define talent as the thing or things a particular child could do or learn to do best?
--Language Arts Teacher

...when we talk I tend to think of an organism that is biologically given, has certain innate dispositions, for example, it either has or hasn't the timbre for success, it either has or hasn't the sixth sense, etc.
--Professor of Psychology

On process-productivity

In thinking of talent very frequently we think of talent as associated with capacity and measurable with some type of test... but I think many people also add to that basic impression of talent not only the capacity but also very frequently the demonstration of capacity.
--Professor of Chemistry

I think that when you think of a talented person you almost have to think in terms of something you've seen that he does or some way he behaves or the way he operates with tools and material. Talking about this without the evidence is pretty hard to do.
--Art Teacher

Well, I believe that the person who presents his talent is more interested in the process than the product but the person who is looking at the talented person, he wants to see the product and oftentimes doesn't see the process.
--Professor of Music

I think the people who argue against productivity are really saying they are interested in a different kind of product... They're interested in, say, for example, what you might call process,--not in the question, does he produce a great novel or a unique novel but does he have a certain kind of experience in the process of producing it and this is creativity or talent. They are more interested in the *process* by which talent gets expressed than in the fact that it *gets expressed*; but I would say that, at this point, they are simply shifting the product they're interested in...they may be interested in interpersonal relations that a person has.

--Professor of Sociology

...Two questions I would raise...Is it possible to measure talent in the absence of something produced?...How much you meant by something that needed to be demonstrated in the classroom or in normal procedure...

--Professor of English

...On this point can you identify talent apart from the productivity--there are a number of school systems where they attempt to identify talent by giving intelligence tests, and designating the high scorers then on those tests as...their gifted children. I don't go very far with that because I don't recognize talent unless it does produce something...

--Social Studies Teacher

...I would agree with you...that some kind of evidence of talent, be it a formal product like a novel or an informal kind of product like a decent human relation, is of the essence of whatever it is you mean by talent; so productivity of some kind is surely involved in the identification of talent. Otherwise how do you know that you have anything?

--Professor of Sociology

...a young girl, let's say, who may talk about wishing to be a painter, or may have all sorts of artistic capacities, however, they might be arrived at...it would seem to me that unless she produced a painting, I don't think I would feel she was talented. And conversely, it seems to me that one could play off such a production of a really talented person against the production of a person who just painted, painted, painted...

--Professor of English

...Where I think I have some trouble is that I can see this at a final mature level of the adult,...whether it's a novel, or painting or the dance or whatever, but when you start making judgments about it, say with a fifth grader or at the junior high...What is the level of development there that you would settle for as a manifestation of talent, whether you take the product or the process end of it? I guess this is one of the things we're seeking, isn't it, some index of how you would measure whatever you would measure at that point before it had yet arrived at the adult level?

--Project Director

There is such a thing as insight and I've met one or two people in my life who have tremendous insight into mathematics, and yet are not mathematicians. They cannot carry through the approach, they can't carry through the work that it takes to make a mathematical idea rigorous...I would say they are talented.

--Professor of Mathematics

Some, I feel, are able to do it without being able to understand how they can do it. Others are able to do it and they know how they can do it and they can explain to you how they can do it. Quite a contrast here. And yet I would regard them both as types of talent.

--Professor of Mathematics

...I don't see how you can measure it (talent) except by an unusual quality product in a thing like mathematics, for example...

--Associate Project Director

I think the thing we have to watch is that partially the definitions you give to a person's productivity do come out of the organizational setting in which he is manifesting it, and then partially, I think, there are certain cultural definitions of what is productivity and what is not productivity that's relevant, and then you couple that with this innately disposed organism and its experience now interacting with the organization and with the culture and you get the manifestation, (the first line manifestation) of extreme abilities in certain specific abilities.

--Professor of Psychology

On whether talent is specific or general

I would think that there are several kinds of talent and the people who one generally regards as talented, especially physical scientists, frequently have a talent or have an interest in other things such as fine arts and music. I think this is probably related to the fact that as I see physical sciences, and also the other sciences, that they are essentially creative. They are a creative endeavor just like the work an artist does.

--Professor of Physics

I think we have some students here who are highly intelligent who are also very talented in many areas and we have some students who are somewhat closer to average intelligence who have some talent in some one area.

--Language Arts Teacher

...again this is something we simply don't know about, that because of interaction between this given biological organism and whatever continuing environment it is exposed to, it manifests what seems to be reflected as a kind of general ability and then a lot of specific abilities in some degree and the thing that we tend to find is that abilities tend more to be inter-correlated...

--Professor of Psychology

One of the things that has been interesting to me is that so many of our students in recent years who have had outstanding ability in the arts have also had outstanding abilities in the sciences.

--Art Teacher

...as I see physical sciences and also the other sciences, they are essentially creative...A scientist tries to describe things... he has to formulate some kind of theory in which the picture fits... A theory is not something you arrive at, but it is something you create...I think it is very much akin to what a sculptor does... Therefore, I think it is not at all surprising that you find that many scientists also are gifted, in the sense that they can do many things, in fine arts...some are excellent painters, some are well-known sculptors, and a great number are musicians, and, of course, a good many of them are adequate mathematicians--frequently because mathematics is a tool but also because it is a creative endeavor...

--Professor of Physics

...when I've seen this happen I've wondered whether its just my lack of perception or my lack of skill as a teacher, but it has always seemed to me that even when they were forging ahead in one area that there were evidences that they could, if their interests led them that way, be very productive in a number of areas.

--Core Teacher

Might there be several disciplines in which talent does appear to be quite specific because of certain physiological developments that are necessary for the artist there?

--Professor of Chemistry

I don't think that a person can be highly gifted in science and not also be highly gifted in mathematics, mathematics being the language of science.

--Science Teacher

...one of the things that bothers me is that it seems to me that as I look at...that he has a general talent, and I can see talent popping out in lots of places. Now I have about five or six in my group where I see this sort of thing happening. Then I see another type, for example, a girl who only seems to have talent in one place, in one spot.

--Core Teacher

> I seem to feel that I see various shades of generality in this talent as it manifests itself. I think the right combination of circumstances might equally well fire this. I've seen it happen. A man changes his major interest and displays a talent in another area due to a set of circumstances that have occurred.
>
> --Professor of Mathematics

> There is another point I see in all of this, ...It may well be that we're not dealing with a single complex but a multiple series of systems each of which would go best within a particular condition.
>
> --Professor of Fine Arts

On indications of talent

> ...I consider a necessary condition for being talented in mathematics as a relatively high I. Q. I'm not sure that I do with reference to talent on the athletic field...High I. Q. is not sufficient, however, because if they do not have high energy quotient, high motivation quotient, this potential talent as measured by an intelligence test may never be realised in the area of mathematics.
>
> --Mathematics Teacher

> ...I think that things that make for talent in the physical sciences are that a person who becomes talented has to be someone who has an inquiring mind...Then, of course, there is the matter of what constitutes having a creative mind and I think here is the matter of imagination and intuition. It is a well known fact that much of the best physics is done not by what is referred to as the scientific method but which is perhaps achieved through intuition. And...there is no doubt that a person must be vitally enough interested in it so he will devote a great deal of time and effort to it. (When questioned on relation of scientific method and intuition.) I'm sure that intuition is problem centered. (Later added power of analysis to list of characteristics.)
>
> --Professor of Physics

> ...I think they (creativity, imagination, intuition, vital interest, an inquiring mind, and power of analysis) are also indications of talent in the field of mathematics...It seems to me that most of these are certainly important in writing--maybe all of them.
>
> --Mathematics Teacher

> ...I think, in science, with respect to talent now that the first prerequisite is high intelligence, and then the interest...where this interest comes in will determine probably where the talent first arises...A student will go along and just work at a bare minimum and then finally come to the realisation that it is interesting and then burn up, and work to his potential and give all indications of being a potential scientist or a highly talented individual.
>
> --Science Teacher

(Following comments on intense interest) Have they got it or has it got them.

--Professor of Mathematics

...People whom I considered talented were, I felt, able to dissociate themselves, to objectify themselves from a particular set of problems of whatever sort, to take a fairly long perspective on something they were reading, something they were writing...

--Professor of English

There's one thing that I've noticed in all people that I call talented--they like to do what they're doing, and they seem not to get enough of it.

--Professor of Music

What we call a talented scientist is the same thing that we call a talented artist in the sense that both of them in some way, to me anyway, take what is initially a given in the field, make it problematic, and then turn what was originally a given into a new perspective. Now in order to do that I think, the person has to be in the position you were talking about--namely able to objectify, to relate himself as an ego to the events that are going on around him, etc. In this process, I would say the mathematician, the scientist, the poet--all...for me--were talented or creative in the degree that they took in some sense what was a given and made it problematic.

--Professor of Sociology

...The artist of our time rebels against one tradition but accepts another. The tradition he accepts is the tradition of art. ...When I talk with people that are producing at the forefront of our field, they are well grounded in philosophy and well grounded in aesthetics and they are well informed people.

--Professor of Fine Arts

On identifying talent

Is it talent only when it gets to this point where it is recognized or is there a latent talent or a talent that we ought to be smart enough to identify in the late bloomer?

--Social Studies Teacher

If we have identified, let us say, three talented people in the fifth grade there is every reason for thinking that if we keep on opening up opportunities...a lot more talents are going to develop. My point is that I can't see that we can ever feel secure in having identified the talent at any one time. There are going to be people in that same group who under a different set of circumstances are going to catch fire and others who are going to catch fire later on, and so on.

--Social Studies Teacher

...if you're going to screen for something out of the ordinary... you don't screen in a particular point of time, your screening has to be all the time...and that then somehow or other--and this is the big job--to do something about your curriculum so that it really can have a differential impact on individual personality. Now it seems to me that if this can happen there's more chance, perhaps, of eliciting something that might not be elicited if the kid is simply a part of a herd.

--Professor of Psychology

...I'm just questioning the setting up of requirements which measure what is now and have no way of measuring the potential which a person has for growing.

--Art Teacher

Aren't we all agreed that talent is something that manifests itself at different stages? The chances are that you cannot finally choose any one level and pick out the talented people for then and for all time.

--Social Studies Teacher

~~Our~~ Or environmental influences

Talent is realized or not very much according to the school program, influence of the home, or community. ...The environment is a very vital factor to the realization of talent. (Would give emphasis to the question: How is potential talent released, nourished, made to grow?)...

This wanting-to-know attitude is not only intellectual but partly a personality trait and I'm wondering if we have to think of that as essentially constitutional. Does that emerge from a certain type of home? ...Do we have something here that is sufficiently related to the youngster's education in a very broad sense that we shouldn't label it too closely as something without relation to its setting...

I've been going over the autobiographies of certain psychologists of some twenty-five years or so ago and over and over again some one of these men had contacts with a book or with William James and it made a tremendous difference. Don't you agree that yes, there is talent there in the first place--but that the right kind of personality touching a person makes a tremendous amount of difference.

--Professor of Psychology

...I don't know quite what I have done to suddenly see a lad catch on fire and start doing mathematics, but I know it can happen.

--Professor of Mathematics

I go along with the idea that we come with certain sensitivities and somehow some of us seem to develop these at a rapid pace and to a greater depth than other people, sometimes because of a rich environment, sometimes in spite of it.

--Art Teacher

I think there is another variable here that may make this latent stuff manifest it or not, that given these skills that a person has potential to be used--I think again because of who he is and because of what he interacts with he develops a certain kind of personality and if this personality is compatible, let us say with being an artist...

--Professor of Psychology

My own feeling is that it might be that the way a talented boy spends his summer is as important as the way he spends the nine months in the classroom or with respect to his home environment.

--Professor of Chemistry

...because of the terrific cultural push now in science and mathematics, the talent we see in the arts seems to be bypassed.

--Art Teacher

On studying talent

...much easier to describe how talent manifests itself than it is to pinpoint what it really is.

--Professor of Physics

...construct validation...It says you start with this kind of crude approximation and then you begin to look at these kids and then you begin to let them describe themselves more concretely because you're now focusing on them and that gradually maybe your construct does emerge, coherent aspect of this kid's behavior that makes things go together, that makes sense and serves to identify him and other kids like him.

--Professor of Psychology

...our defining of talent is a way of defining what we value and what we are going to undertake to do. It is the school's responsibility to help the child discover who it is he is and what kind of instrument he's living in the midst of and has the possibility of going through life with...As school people we need a way of looking for talent that encourages us to help the student...to look for his own talent and to nurture that.

--Coordinator of Research

> The thing that I feel is important here is that when you talk about talent, for example, as we have just talked about it, from the point of view of the actor, from the point of view of the person who is now manifesting whatever is to be manifested, then I like to contrast this with viewing it from the point of view of the task setter in the particular organizational setting. He has certain expectations; he requires certain things to be done. He assesses this guy from the view of the organization and the tasks that are required. Then, I think, you have a third view which is equally important and that is the view of the observer. Now in this case I think--and the reason I'm drawing these distinctions is that you are partially task setters, you're participating in an organization, and you are partially observers--that you yourself are trying mightily to detach yourself from this situation.
>
> --Professor of Psychology

> ...two classes of talent, Class A, let us say--they can go in any one of a number of directions. I think with these people it would be important to explore a little more what that range of direction is so that the student himself could come to have some appreciation of the range of possible life openings--he ought to be aware of some of them...Then the second, the type B which would seem to be the sort of person who seems to be highly talented in a very narrow area. My guess is that this has to do with the classical forms of discipline as we know them, such as music or painting...

> ...I think you wouldn't need to refine this (hypothetical model) highly or completely in order to move ahead and test out a number of these things to see whether it fits.
>
> --Project Director

It would be difficult to point out specific conclusions reached as a result of the exploratory discussions. However, the comments and suggestions of the various participants were a source of great encouragement to the project staff and did serve to clarify some issues as well as give some direction to the development of a conceptual model of talent.

Formulation of the Tentative Model

At the same time that the exploratory interviews and the interdisciplinary discussions were being held, two other sources of data were being scrutinized--the school records; and reports on prior research in child development by the University School Staff[1] and theoretical formulations such as those by Mooney[2] and Pepinsky.[3] The preliminary formulation of the hypothetical model follows:

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[1] *How Children Develop*. Faculty of the University School. *Columbus, The Ohio State* University, 1946. The statement of philosophy and purposes by the University School faculty has relevance here also. See *The Philosophy and Purposes of the University School*. Faculty of the University School. Columbus, The Ohio State University, 1948.

[2] Ross L. Mooney, *A Preliminary Listing of Indices of Creative Behavior*. Bureau of Educational Research, 1953, 11 p. (mimeo.) and "Evaluating Graduate Education," *Harvard Educational Review*, 25, 85-94 (Spring, 1955).

[3] Harold B. Pepinsky, "Productivity in the University," *Personnel and Guidance Journal*, 35, 134-139 (November, 1956).

UNUSUAL TALENT

A Tentative Hypothetical Model

August 7, 1958

by

Elsie J. Alberty
The University School
The Ohio State University

UNUSUAL TALENT

A Tentative Hypothetical Model

The model presented here is an attempt to describe the type of individual whom the faculty of the University School view as unusually talented. It was formulated on the basis of an analysis (in terms of the functional roles of the unusually talented individual) of: interviews and small group discussions involving members of the University School faculty and other members of the Ohio State University faculty representing the natural sciences, social sciences, and the humanities; University School publications such as How Children Develop and The Philosophy and Purposes of the University School; and, pertinent research. It has three dimensions among which there is a continuing interaction: (1) The individual and his internal frame of reference; (2) The individual and his relations with others; (3) The individual and his orientation to the situation.

Your preliminary reactions to the tentative hypothetical model of unusual talent would be very helpful to us in getting underway this year. At this stage, we would like for you to study the model in order to become generally oriented to the statement; and, to raise questions, make suggestions, and the like.

As you study the model it might be helpful to keep in mind one or two individuals whom you judge to be unusually talented. (Abbreviated case histories of two students designated as unusually talented by a number of University School faculty members are attached for you consideration.) Questions such as the following might serve as a take-off point for your reacting:

1. What are the characteristics of the unusually talented individual as you know him?
2. Do you feel that the tentative model is fairly descriptive of the type of individual you think of as unusually talented?
3. What modifications would you suggest?

Please feel free to write out your reactions to the model, including such points as your overall impressions, modifications you would suggest, and anything else you might want to say.

UNUSUAL TALENT

A Tentative Hypothetical Model

The individual and his internal frame of reference

1. Self-concept -- the view or perception an individual has of himself

   The unusually talented individual is realistic in his self-appraisal. He can be very objective about himself, and he can see and accept himself -- his potentialities, strengths, weaknesses -- as he is, not as he would prefer to be. Closely related to self-acceptance is his acceptance of others and of the world about him. He has a positive picture of others and can see and accept things as they are.

2. Value system -- a set of values which give meaning to action

   The unusually talented individual has his value system in order. He is autonomous. His behavior is determined by his own set of values rather than by the standards of the group. His impulses, thoughts and actions are usually unconventional and spontaneous. He has learned, however, to what extent to control his impulses and tends to operate under some degree of evaluative restraint.

3. Energy level -- the intensity and direction of problem centered activities

   The unusually talented individual has a clearly defined concept of the "ideal self" which he hopes to achieve. He has the endurance and the drive for accomplishment and recognition. He can make a sustained effort, even surmounting obstacles -- personal or interpersonal -- in order to achieve success.

The individual and his relations with others

4. Concept of others -- the view or perception an individual has of others

   The unusually talented individual has a positive picture of others. He is realistic in his appraisal of their strengths and weaknesses but can accept them as they are.

5. Interpersonal relations -- interaction with others

   The unusually talented individual has a great capacity for empathy and understanding and can learn from anyone who has something to teach him. He is friendly with everyone but is not dependent on others for succorance. He is capable of detaching himself from others and is not at all uncomfortable in being alone.

The individual and his orientation to the situation

6. Sensitivity to problems -- an awareness of and responsiveness to gaps in the environment

   The unusually talented individual is highly sensitive to the gaps that exist in his environment. He has a great deal of curiosity and is not readily satisfied with present explanations of why and how the world works. Closely associated with this sensitivity to problems is the unusually talented individual's capacity to tolerate ambiguity. He is capable of existing amidst a state of affairs in which he does not comprehend all that is going on. He finds doubt and uncertainty a stimulating challenge, and he is willing to suspend judgment and to not make commitments immediately.

7. Involvement -- identification with the problem

   The unusually talented individual is strongly focused on problems outside himself, and he can become so involved in these problems that everything else is blocked out. He is capable of maintaining this high degree of concentration for considerable periods of time. Often he is so closely identified with a problem that he completely loses self. He is persistent and capable of great devotion to the task at hand -- so much so that he is able rather easily to detach himself from others.

8. Problem-solving process -- Interaction with the problem

   The unusually talented individual can define problems and project possible solutions. He is open-minded, flexible, not closed to anything new or different yet maintains a critical attitude in making judgments. He does not stay in a rut but branches out rapidly into new channels. In one way or another he shows a special kind of creativeness. He is capable of sharp, significant insights and is willing to "crawl out on a limb" to test out his ideas. Closely associated with the development of insights is the unusually talented individual's ability to form sharply defined concepts quickly and easily, to manipulate them and to perceive subtle relationships between them. He is adept at generalizing from first-hand experiences and applying his learnings to new situations.

Preliminary Reactions

Please write freely about your reaction to the tentative model. You might include such points as your over-all impressions and modifications you would suggest. Anything else you might want to say would be appreciated also.

PART III

VALIDATING THE TENTATIVE MODEL OF TALENT

The tentative hypothetical model of talent presented in Part II was an attempt to describe the type of individual whom the faculty of the University School view as unusually talented. It was formulated on the basis of an analysis of: interviews and small group discussions involving members of the University School faculty and other members of the Ohio State University faculty representing the natural sciences, social sciences, and the humanities; University School publications such as *How Children Develop* and *The Philosophy and Purposes of the University School*; and, pertinent research. The procedures used in validating the model were: (1) the solicitation of reactions from the University School faculty and from other members of the Ohio State University faculty who had expressed an interest in this phase of the study; (2) observation of unusually talented students in an eighth grade core class; (3) continued study of the literature. Each of these procedures will be described briefly in the discussion which follows.

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Reactions to the Tentative Model

Every year the University School faculty reserves the week prior to the beginning of the Autumn Quarter for a series of pre-school meetings. These meetings are, for the most part, devoted to the more immediate problems of program planning. However, there usually is time set aside for reports on research projects, for individual work by staff members, and for other items concerned with planning the year ahead.

During the Fall Planning Week for the school year 1958-59, there was an opportunity to solicit the preliminary reactions of the entire

University School faculty to the tentative model of talent. Following a general discussion of the purposes of the study and the steps taken, the total faculty was divided into seven small work groups. The groups were set up so as to involve faculty members who teach at various levels (kindergarten--grade 12) and in various areas. Most of the group members had previously been interviewed, and all had received the following materials prior to the meeting: a brief description of the study; abbreviated case histories of a high school girl and a high school boy considered by a number of University School staff members to be unusually talented; and, the tentative hypothetical model of talent. The instructions accompanying the materials included these suggestions:

> Your preliminary reactions to the tentative hypothetical model of unusual talent would be very helpful to us in getting underway this year. At this stage, we would like for you to study the model in order to become generally oriented to the statement; and, to raise questions, make suggestions, and the like.
>
> As you study the model it might be helpful to keep in mind one or two individuals whom you judge to be unusually talented. (Abbreviated case histories of two students designated as unusually talented by a number of University School faculty members are attached for your consideration.) Questions such as the following might serve as a take-off point for your reacting:
>
> 1. What are the characteristics of the unusually talented individual as you know him?
> 2. Do you feel that the tentative model is fairly descriptive of the type of individual you think of as unusually talented?
> 3. What modifications would you suggest?
>
> Please feel free to write out your reactions to the model, including such points as your overall impressions, modifications you would suggest, and anything else you might want to say.

The small groups were asked to focus on questions 2 and 3 (above) and to report back their impressions to the total group at the close of the session. The following comments abstracted from the reports of the small groups describe each group's reactions to the model:

> Group I: Unusual talent as used here seems to refer to the "cream of the cream." We saw no mention in the model of capacity to learn and achievement; however, these were evident in the case histories. Should more mention be made of the individual's general health, physical development, and endurance? What about the many facets of interests and curiosities? Are these emphasized sufficiently? To what extent should sex differences be considered in making models?
>
> Group II: There was a problem of different concepts of the word talent in our group. We had the idea that the model was a fixed thing--more typical of a well adjusted and fully developed individual. We're not sure that a talented person always has these qualities. Talent is "fuzzy" for us, perhaps because we keep thinking of persons we know who have talent but who do not seem to fit into this type of model. For example, we discussed talented students who do not seem to have their value system in order. Also, some members of our group were bothered by the lack of mention of what the talented person gives out rather than merely what he accepts in the environment. Others questioned the emphasis on socialization.
>
> Group III: Our greatest difficulty was with definition. The model seems to be a good goal, but probably no one would attain it because everyone has his "flat sides." Should there be other models for other stages of development? The question of singular talent was also brought up. Can we call these people talented? Is talent relative? Where is the dividing line between those who are talented and those who are not talented? Several in the group raised the question as to whether high intellect and ability are likely to be squelched by the emphasis on social adjustment in this well rounding?
>
> Group IV: We spent most of our time discussing the youngsters in the case studies, their home backgrounds, opportunities, etc. We wondered what these students would have been had they not been in a school like this. We've all seen examples in the public schools who became dropouts. Their home opportunities, among other things, were not the same. Is this model somewhat fictitious in regard to the "typical" adolescent, point 5 in particular? Also, there is not much here on the physical aspects of growth, and development.

Group V: We got tied up in the definition of talent...Would the unusual character of the definition discourage the reception of the report? Is it necessary to be well educated in order to be talented? (The model seems to assume an education.) Who determines what is a "worthwhile" activity? Consider, for example, such personalities as Capone, Hitler, Dillinger. Is "evaluative restraint" necessarily true of a talented person?--thinking of examples of people we've worked with here in school. We have the same reservations in regard to succorance and friendliness. We're thinking of two models--one as a developmental goal, the other more to describe talent, to help us identify such a person before he reached this goal--one model, "what is it?", the other--the "becoming" idea.

Group VI: The model seems to be a long-range goal. We agreed with four of the eight points--3, 6, 7, 8, but had reservations about the other items. At times, energy level, for example, is tied up with a real or imagined weakness. The following points on the model we question:

Point 1: Talented people often aware of their strengths--not so aware of their weaknesses and even when aware of their weaknesses, they tend to neglect or not correct them.

Point 2: Value system: value systems may be in order but may not necessarily be the same as society's.

Point 4: Positive picture of others--this a goal and not a condition. A lot of talented people really do not accept weaknesses in other people.

Point 5: Some talented individuals aren't always friendly but usually can detach themselves. Talented youngsters in general may be comfortable in being alone, but not always.

Group VII: We feel that the model is more the exception than the rule. We would answer the first question (Is the model fairly descriptive of the type of individual you think of as unusually talented? more no than yes. It seems to us that most individuals are elliptical rather than well rounded as the model would indicate. We weren't sure how the consideration of high ability came in until we came to No. 8. And doesn't No. 8 really encompass the first seven points?

The reactions of the University School staff to the tentative model of talent are summed up in this memorandum from the principal investigator to the staff:

To: The University School Faculty

Re: Reactions to the Tentative Hypothetical Model
of Unusual Talent

As you know, the relationship of creativity to psychological health has long been argued. A similar argument seemed to arise in our consideration (during Fall Planning Week) of a tentative hypothetical model of unusual talent. The idea that to be unusually talented is in some sense--perhaps the best sense--to be a fully developed, psychologically healthy person cannot easily be dismissed. Yet, we all were able to offer numerous examples of individuals whom we as a faculty viewed as unusually talented whose human relations (to name but one of the points with which many of us took issue) do not square with our concept of the well-rounded person. Nor were we altogether certain that the unusually talented person would more nearly realize his potential if he were to become the "perfect" model of maturity.

We were somewhat in agreement, it seems to me, on the following:

1. Unusual talent is not necessarily synonymous with maturity. The unusually talented person is not necessarily a well-rounded individual; he may have some flat sides.

2. Talent is a function of the entire personality. For purposes of our research talent may be defined as the style of engagement which each individual tends to use in his most rewarding fulfillment. That is, talented individuals are fulfilling themselves and doing the best that they are capable of doing. This basic "fulfilling" is a necessary but not a sufficient condition of unusual talent, however. Unusual talent refers to basic fulfilling coupled with outstanding achievement (productivity) in one or more of the major fields of knowledge or some other area of human activity. While achievement (productivity) is not synonymous with unusual talent, it seems likely that unless there is some minimum of productivity there is little probability that the individual is unusually talented.

3. All individuals potentially are talented. Differences in talent that exist among individuals are quantitative rather than qualitative. When viewed in relation to a continuum of talent the unusually talented individual merely has more of what every individual has.

4. Unusual talent is not simply a matter of fixed hereditary potential.
   Unusual talent is not merely something one is born with which will develop on its own. Talent is a dynamic thing, and as such is subject to nurturance or inhibition.

5. Unusual talent is a product of internal factors in the individual and an external environment which stimulates, motivates, and provides opportunities for development.
   Individuals affect and are affected by the environments in which they live. As they interact with their environments, changes occur in both directions.

On the basis of our preliminary faculty discussion of the proposed hypothetical model, continued study of the literature, and observations of youngsters in the eighth grade core class; the first draft of the model is being revised. Again, the attempt is to clarify the University School concept of talent.

In revising the model we have been concerned with how the unusually talented person orients himself to the situation. That is, the focus is upon how the individual handles himself in relation to the situations in which he achieves his most rewarding fulfillment.

E. J. A.
10-27-58

Several other individuals who reacted to the model raised many of the same questions. The model seemed to be acceptable as a model of maturity, but there was considerable doubt as to whether it was also acceptable as a model of talent.

Observations of Unusually Talented Students

In the Autumn Quarter, 1958, eighth grade students considered by their teachers to be unusually talented were observed in the core class. The core program in the University School as suggested earlier in this report, has responsibility for providing a variety of experiences. Among these are the core learning unit, activities related to group living, and individual reading and writing programs. And, after several days of observation, it was decided to limit the observations at this stage of the project to that part of the core block of time concerned particularly with the development of the learning unit. The observations were further limited to the planning (selecting) phase of the unit (approximately three weeks in duration).

The observations were undertaken as a further check on the tentative model of talent. In the hypothetical model unusual talent was described in relation to three dimensions: (1) the individual and his internal frame of reference; (2) the individual and his relations with others; and, (3) the individual and his orientation to the situation. Specific hypotheses focused on the unusually talented individual's self concept, value system, energy level, concept of others, interpersonal relations, sensitivity to problems, identification with the problem, and interaction with the problem.

In order to observe in detail, each of the two observers selected a child on whom to concentrate from among those suggested by the teacher. The choice of the observers was not completely open, however. It was agreed that, if possible, the children selected should represent different I. Q. levels (both should not have extremely high I. Q.'s) and different areas of talent (as judged by their teachers). Also, they should have entered the University School in the kindergarten-primary grades (in order to capitalize on school records). It was thought that it would be advisable to observe a boy and a girl, but the judgments of the eighth grade teachers suggested that it might be more appropriate at this stage to focus on several boys who seemed to be unusually talented. It might be interesting to note that of the twenty-eight students in the eighth grade class, twenty-four were designated as talented by one or more teachers. Among the areas mentioned were science, mathematics, social science, linguistic facility, leadership, art, drama, dance, mechanical ability, and athletics.

Two boys, Mike and Mark, were selected. Mike, I.Q. 154, had entered the University School in the four-year kindergarten. He was described by his teachers as unusually talented in science, mathematics, and linguistics. Mark, I.Q. 117, had also entered the University School at age four. He was considered by his teachers to be unusually talented in writing and human relations. His potential in mathematics was also mentioned.

After several attempts to record the behavior of the selected students in relation to the specific hypotheses (above) it was decided to keep detailed running accounts of each boy's behavior, without particular reference to the model, in these parts of the core block of time which involved the selection of the core learning unit. The principal investigator from time to time teamed up with each of the observers in order to verify their recordings.

Selecting the Unit

The following description of activities leading to the selection of the core unit provides a framework for interpreting the observation records.

ACTIVITIES LEADING TO THE CHOOSING OF OUR UNIT[1]

> In setting the stage for a good eighth year, the first day we reviewed our agreements of last year for living together, underlining such things as thoughtfulness of others, keeping the noise level down, taking turns in speaking, listening to the person speaking, asking for help when needed. We looked at the value of eighth graders taking an especially careful look at themselves since they would in another year be in senior high school; a careful and honest look at strengths and weaknesses and the need to make each day count in the development of a better individual. It was mentioned that many had not really pushed themselves very hard last year even though it seemed to be a most successful year and that we should aim at more "stretching" toward our goals.
>
> On the second day the class was reminded that a year ago as new members of the upper school they had been asked to write down what they thought core was and after compiling a list of the characteristics the class understood to be basic to core, we invited Mrs. Alberty to talk to us about what she saw as included in that term.
>
> In order to be sure that we all were talking the same language and understood one another when we talked about core this year, the class was asked to take another look at this question, this time in small buzz groups. Each group selected a chairman and a recorder. After a 20 minute session they reported and the results were compiled into a list which the teacher next day dittoed, adding several items which she felt they had overlooked. The class accepted these additions.

What is Core?

1. Core is the most important class.
2. We are all together in core.
3. It is the hub of our schedule.

---

[1] Prepared by L. Jane Stewart, Eighth Grade Core Teacher.

4. Core is not a special subject but a tie-in of several.
5. When you speak of a grade you are speaking of core.
6. This is a place to improve subject that you can't anywhere else in the program.
7. Core is the social center of the class.
8. Core is the combination of a number of classes.
9. Where we learn to think for ourselves and be more independent.
10. Where we learn a wide variety of subjects.
11. Where we get a background in world affairs and how to express ourselves.
12. Core helps us in choice of good literature, helps in grammar, creative writing, spelling, current affairs.
13. We learn to pursue our own interests.

Would you accept these characteristics?

1. A block of time.
2. Pupil-teacher planning.
3. Problem solving approach.
4. Guidance.
5. Required of all.
6. Evaluation.
7. Fundamentals.

Then the point was made that since the term democracy seemed to figure so largely in the philosophy of our school and the purposes of core, it might be well to take a look at this term and see if here, too, we were talking the same language. The dittoed statement (below) seemed to make sense to the class. They agreed that the hard part was to play hard to win and yet be considerate of the other person or the group. Core seemed to be a place where it was possible to have many experiences which would help us learn to make democracy work.

What Democracy Means[2]

> Democracy means freedom. It means that people are free to make full use of their minds and to develop without interference all of their interests and abilities. They are allowed to take charge of their own lives.
>
> Freedom is not as easy as it sounds. It is not enough to be free as the air. The wind sometimes spends its energy scattering leaves. People who are free to do as they please have to decide what they are going to do with their freedom. As long as there is someone else to tell you what to do, you do not have to think very much about what's going to happen next. But when freedom comes and you take charge of your own affairs, you have to begin choosing and making plans.
>
> But sometimes people get tired of trying to run their own affairs. They want someone else to solve their problems

---

[2] Excerpts from Ryllis and Omar Goslin, Democracy. New York: Harcourt, Brace and Company, 1940.

and decide what should be done. And as soon as they turn over the job to someone else, they give up their freedom.

Democracy means self-government. If boys and girls and men and women are to enjoy freedom they must be willing to take the trouble to govern themselves.

Democracy means differences of opinion. It means taking sides and playing to win, instead of merely follow-the-leader. It means discussion and argument instead of just accepting what somebody else says. It means that instead of having only one thing to do or one way to go, boys and girls and men and women can help to decide on the next play in the game, or the next turn in the road, or the next study to be studied.

Did you ever watch a bunch of hungry pigs shoving each out of the way to get to the trough? It's a case of every fellow for himself. The biggest ones get there first and haven't time to bother about the little ones who can't get near enough to eat. That's why we always think of pigs as being bad sports. Bad sports aren't willing to give everybody a chance to play. They don't care if some people get left out of the game. All of us like to win. That is part of the fun of playing a game. But there are always times when we have to lose. Being a good sport in a game is often easier than being a good sport in an argument. But democracy means tolerance, the willingness to give everyone an opportunity to express themselves.

It also means patience. Take a walk by yourself out into the country and you can go as fast as you like and choose your own direction. But you may get lonesome. Go with your family and you will have to let them help decide where you go and how. Democracy means patience. It means determination to find a peaceful method of getting things done. It means learning to make decisions for yourself and yet how to take part with others in making rules and decisions for the good of all. It means listening to all points of view, and choosing what seems to be right.

Democracy is not easy for individuals or for groups of people. It requires training and plenty of practice. Wrong roads are followed. Plans have to be tried and tried again before they succeed. But mistakes can be corrected and good plans made only if all of us are willing to accept our share of responsibility and are willing to work hard to make it succeed.

One of the first big experiences was choosing the study for this quarter and looking carefully at possibilities for Winter and Spring Quarters. Copies of the criteria for choosing a study which we developed last year were passed out and examined to see if we were satisfied with them now.

Criteria for Selecting our Study

The core unit:

1. Should be something that we need, not just what we want.
2. Should be something we haven't done before.
3. Should be interesting to all of us.
4. Shouldn't be too broad or too narrow.
5. Should have enough materials: books, magazines, trips, films, radio programs, speakers.
6. Shouldn't be too difficult.
7. Should be chosen from one of the 14 problem areas.
8. Should be able to make use of some of the people in art, music, science, etc.

A few suggestions were made and incorporated in the list.

Someone in the class remembered that we phrased our suggestions for a study last as questions and it was recalled that we were trying to locate problems to solve rather than topics to study. It was suggested that a topic might be South America, but a problem would be, "Why have relations between the United States and Latin America become difficult?"

As homework the class was to try to frame some problems which might make for good studies, and to check them against the criteria before presenting them to the class. It was suggested that parents would be an excellent resource for such an assignment.

The following day these problems were suggested:

Problems to Consider for Our Study

1. What are the conflicts between the state and federal government?
2. Is world government possible and how can it be achieved?
3. Is it true that Americans are not liked and respected abroad and if so, why?
4. How is the communist influence in the rest of the world affecting our government?
5. What is and should be the role of the U. S. in world affairs?
6. How can the over population problem be solved?
7. How can we build one world? How can countries with different values and beliefs get along peacefully?
8. What are the major religions of the world and what are the beliefs of each?
9. Is political equality the same as social equality? What is behind the conflict between the state and national government on the segregation issue? What is the present situation of the American Negro in regard to schooling, housing, employment and out of what background did it grow? Segregation: What it is, why it is, and what can be done about it?

10. Is our government too big and too complex?
11. Can we trust Russia and does she want world peace?
12. What is the relationship between the U.S. and the countries of the far east?
13. What are the strengths and weaknesses of a democracy and the Russian form of government?
14. What is U.N.E.S.C.O. doing in the field of education?
15. What are the strengths and weaknesses of our schooling and the Russians?
16. How can we learn more thru international cooperation about the earth?
17. ...stopping nuclear tests?

The planning committee (4 students plus teacher) suggested that once we had all suggestions listed and sifted, combined, re-worded, and eliminated questions, we should have those left investigated by small groups.

It was difficult for the group to eliminate questions since most seemed to have been carefully thought out and presented, but during a class discussion a direction seemed to emerge and the following day the teacher presented to the class for their consideration what seemed to be the sense of the previous day's discussion: a list of seven problems which fell into 4 problem areas.

Problems of our Government

1. What are the conflicts between the state and national government?
2. What should be the role of the U. S. in world affairs, especially in the far and near East?

Problems of Peace and International Understanding

3. How can we build toward peace in one world?
4. Should we stop nuclear testing and what are the problems involved?

Problems of Values and Belief

5. How can we better understand the religions of the world?
6. What is involved in the present conflict over the segregation issue?

Problems of Conservation of Natural Resources

7. How can we learn through international cooperation more about the earth?

Essentially, this was accepted by the class. At this point the teacher asked if anyone could tell her what an issue was. After a discussion which included everything from wild guesses to dictionary definitions, they decided that an issue was a controversial question.

Then they were asked to try to identify issues under each of the problems listed. This was a difficult assignment but one which was challenging to most and the majority worked at the job although one student said he's worked two hours and you'd never guess it from the results he had to show.

Once the class was fairly comfortable in identifying issues, we tried to see the difference between raising an issue and raising a question which wasn't an issue but which might help us better understand the issue.

A ditto sheet was used to focus on such things as:

The Problem Area
The Study
Purpose of the Study
Issue to be raised
Questions to be asked
Possible materials, speakers, trips, activities

Each student chose one problem to look at closely and to work through on the ditto sheet. Then the planning committee's suggestion for a close look by a team, or committee, was tried. The teacher posted a list of 8 committees and then at random assigned each a problem to work with carefully. She explained that this was viewed as an opportunity to practice working hard on a job whether it was one which you were particularly interested in or not. Several students objected, stating that they wouldn't do as good a job on something they weren't interested in. Again, it was pointed out that it was easy enough to work enthusiastically on something you were enthused about but it was a real challenge to put as much conscientious effort and energy into a job just because it was worthwhile and needed to be done, and, therefore, this was one experience in school that everyone needed.

It was also pointed out that everyone would have an opportunity at the time of each group presentation as well as when the final choices were being made to testify as to their convictions and to plug for any study that seemed especially worthwhile to them. The class agreed that this would be hard to do but would work at it. During their work period the librarian came to the core room and moved from group to group, answering questions about materials and giving suggestions.

The group did not start with equal advantages since the work sheets which individual students had turned in tended to cluster around a few problems. Those groups had these worksheets to use as a starting point while some groups, especially two which had just been added that day, had to start from scratch.

It was interesting to note that with only two exceptions the students settled down to do a work seriously on this job.

Before the meeting when the groups reported the teacher attempted to work through all the areas again but giving special attention to the ones where the committee had to do the most digging. The thought being that she might be able to fill in any gaps in the discussion the next day.

One student remarked that stating a purpose for the study was even more difficult than raising issues and that was hard enough!

Recording Student Behavior

The observations were recorded on a time chart which included the general situation, the stimulus situation (the situation of the moment), and the sequence of behaviors of each boy. Charts I and II represent fragments of each boy's record.

An analysis of the time charts for the three week period involved in selecting a problem for study in the core and the reactions of the observers suggest the following behavioral descriptions of the two boys under observation:

Mike: reads intently, maintains high degree of concentration for considerable periods of time;

in motion almost constantly, rubs eyes, face, hair, taps foot, tilts back in chair; chews tongue; engages frequently in conversation with his neighbors;

responds vigorously and whole-heartedly in the discussions in which he participates, tends to talk "off the top of his head" without first organizing his ideas; often dominates discussions, comments occasionally seems picayunish; at times appears oblivious to what is going on, leafing through pamphlets, reading books, playing with a pencil, doodling, but when he gets into the discussion he gives evidence of having followed the discussion; his contributions to discussions reveal breadth as well as depth of interest; particularly interested in science-oriented problems;

defines problems clearly, sharpens issues, raises significant questions; curious, not easily satisfied with explanations offered by teacher or classmates; tremendous drive to delve more deeply into things; persistent;

clarifies and organizes suggestions of his classmates, projects possible plans;

is sharp, insightful, sees through things quickly, readily deals with abstract ideas; generalizes with ease.

Mark: reads intently, concentrates for fairly long periods of time, sometimes rather easily distracted by his classmates;

constantly active, plays with pencil, chews fingers, fiddles with notebook, papers, etc.; wastes little time;

responds enthusiastically in the discussions and other class activities in which he participates; usually organizes his thoughts before contributing to a discussion; makes his point quietly and clearly, takes a strong position but states it tentatively; listens carefully to what others have to say; often defers to others in a discussion; considerate of others, criticizes the ideas advanced by others in a positive, friendly fashion, accepts criticism with grace and ease even when it is not gracefully given; tends to respond to ideas advanced rather than to the identity of the individuals advancing them or to the manner in which they are presented; is not intimidated by the more aggressive members of the class, tends to ignore their efforts to push his thinking in a particular direction; seldom takes sides with the various factions in the class, raises questions which suggest a compromise between the opposing points of view; his contributions to discussions reveal breadth as well as depth of interest, particularly concerned with social problems;

clarifies problems and issues; encourages others to clarify their thinking; eager to share ideas; alert; excited by discoveries made in carrying out various class activities; assumes leadership role quietly yet forcefully;

curious, tremendous drive to dig deeply into problems and issues which concern him; persistent; willing to suspend judgment; open-minded.

CHART I

FRAGMENT OF AN OBSERVATION RECORD
(Mike)

Situation	Stimulus Situation	Time	Behavior
Free reading period	Most students are reading. A few are working on core assignment. Some are moving about the room.	10:40	(To Richard) "Let's go see (science teacher) this afternoon." Chats with Richard.
		10:44	Approaches teacher at her desk, talks briefly (mimeographed materials in hand) then wanders over to Sandy and Cathie, then back to teacher, searching for something.
	Teacher, with Mike, looks around room for list of films available on campus. Finally, after announcement, found that Mark had it. Doug wants to use it when Mike finishes.	10:45	Gets film list, then chats extensively with Chris. Looks around for pencil. Writes on assignment sheet (while chewing tongue. Appears to be copying something from Chris.)
	Teacher distributes Science Worlds.	10:50	Mike looks at cover, calls Billy's attention to cover picture, then resumes writing, talking some with Chris. He has not yet given attention to the campus film catalog. "Four books and three magazines, I have now, Rich."
	Teacher cleans out closet assisted by Doug and Clovis.	10:55	
	Doug distributes copies of "Big Battle" dittoed material.	10:57	Mike gives very brief attention to dittoed materials.
	Jeff comes over to Mike's table and looks at "Big Battle" with Mike.	10:58	
	Mark N. asks Mike to scoot over beside him. Teacher asks Doug and Clovis to put things in closet.	10:59= 11:00	Mike refuses, but moves over anyway. Starts looking some at film catalog, continuing to give most attention to writing on assignment sheet.
		11:04	Mike and Chris laugh over something written on Mike's sheet. Jeff joins them and copies something. Richard and Mike talk concerning some material in Science World, although Mike has not yet opened his. Attention continues on sheet.

CHART I
(Continued)

Situation	Stimulus Situation	Time	Behavior
Discussion of possible study problems	Teacher opens discussion of problem list. Requests full attention of all. Reports that she has reduced problems to 7 in number, placed in 4 areas. Writes these on board. Teacher asks group to consider her work to see whether it's acceptable. Holds all comments until time is given for consideration.	11:10	Mike yawns. Puts away Science World, sits with back to teacher.
	Teacher asks for reactions or suggestions. Mark N. thinks 7 is too narrow. When Mark N. briefly leads discussion he immediately calls on Mike.	11:15	Hand is not raised, although several others are. Hand goes up, but is not first. Comments, "If anything, it's too wide. It's wider than last year's conservation study."
	Clovis does not see connection between conservation and IGY. He calls on Mike for rebuttal.	11:20	Chair topples backward and falls on floor. Gets up. Mike defends position.
	Discussion of conservation and IGY as possible study problem.	11:22	Raises hand. Suggests studying one aspect of one of the listed problems (reiteration of teacher's statement).
	Don raises question on segregation--historical background should be stated.	11:25	
	Mark S. would consider widening it to discrimination in other areas. General discussion.	11:28	Mike is writing on assignment sheet. Chats with Chris. Doodles and chews tongue.
	Shirley says she doesn't like wording of problem on segregation	11:32	Gives very brief attention to discussion.
		11:36	Had been doodling. Now questions wording of problem #1 (should be related to segregation issue.) Argue with Richard over what he had said previous day.
	Discussion of wording of #6.	11:42	Disagrees with wording of #6.

CHART I
(Continued)

Situation	Stimulus Situation	Time	Behavior
	Teacher places #13 on board (at Nike's previous request).	11:47	Private argument with Mark over whether #6 is now adequate. Chats with Mark S. and Chris. Chair is over near Mark's.
	Archie proposes questions on aviation.	11:50	Mike and Richard seek clarification and organization.
	Susie: What is UNESCO? Frank tries, says "emergency" instead of "education".	11:51	Mike raises hand immediately. Corrects Frank on what UNESCO stands for, then gives entire name
	Susie: Problem of city, state or federal government. Richard suggests a narrow problem within Susie's.	11:52	"I think that any one of them would be too big." (Sits with feet on chair near Mark's.) Pulls chair near to Richard's. Chats with Richard for several seconds, then with Chris.
	Franklin proposes another problem on democracy.	11:57	Resumes doodling.
		11:59	"Should #8 be under conservation?" Leafs through Science World. Talks with Chris and Richard.
	Dismissed.	12:00	Rises immediately and walks out, talking with Richard about Science World. (Note: Observer noted that doodling project seemed to relate to the cover picture on Science World.)

CHART II

FRAGMENT OF AN OBSERVATION RECORD
(Mark)

Situation	Stimulus Situation	Time	Behavior
Free reading period	Teacher enters room. Mark goes to teacher, who tells class that he wants to describe book.	10:40	Mark enters and leaves room, takes seat, turns to talk with Mike and then Jeff. Goes up to teacher with book "The Moon is Down." Teacher announces to class that Mark has a book which he feels is "so wonderful that he wants to explain it to you." Mark explains contents of book to class. He states, "I'd really recommend it..."
	Teacher comments that Steinbeck is an author the class might get acquainted with.		In response to teacher's comments on Steinbeck's writing, says he has read several of his works and comments, "Every one I've read, I've loved."
	Reading time continues. Teacher talks with Harold.	10:50	Mark returns to chair. He gets up and both he and Mark N. talk to teacher. Teacher looks at clock and all three leave the room. Teacher returns, and later Mark N. Some time later (11:01)
	Other students reading. Mark talks with teacher.	11:02	Mark returns to room and talks with Chris.
Discussion of possible study problems	Teacher passes out list of possible study problems for class to reconsider.	11:04	He returns to chair, looks at paper passed out by teacher, and leaves chair again to talk with teacher, returns to seat. Mark turns and talks with Chris as teacher opens discussion.
	Teacher points out questions that have not been mentioned previously in class.		
	Teacher reminds class that she asked them to consider questions suggested by the science teacher. Asks how class thinks about a problem.		In response to teacher's question on how he thinks about a problem, Mark states that he gathers information to see what he can learn from it.
	Discussion on thinking about a problem continues.	11:10	Clovis states that he sometimes takes a walk to think about a problem. Mark asks if he discusses it with anyone?

CHART II
(Continued)

Situation	Stimulus Situation	Time	Behavior
	Teacher comments on the use of dictionaries which only one person mentions as a source of information for problems.		Question on what "procrastinate" means--a word used by the teacher. Richard starts to answer and Mark says "to dodge or avoid." Mark raises hand during brief discussion on dictionaries and then lowers his hand after another student comments.
	Discussion on use of radio. Possible time to listen to radio or watch television. Various times are suggested for morning hours before school.	11:15	Teacher asks about time of news broadcasts. Mark states, "There is one at 7:00 and at 7:30, and..." Mark states again while students discuss time of news program, "There is one at 7:30". Later, Mark says, "I think for most people the best news cast, by far, is CBS news at 8:00 o'clock." Mark remains silent while Mike suggests program on Physics. Mike moves up near Mark's table. Mark does not turn around when Mike moves his chair.
	Discussion of specific problems on list resumes. Richard suggests an added problem on IGY. Teacher asks how many students have thought about the problem.	11:25	
	Students discuss Clovis' suggestion for a topic on nuclear tests	11:32	Clovis suggests question on nuclear tests. During discussion Mark suggests a re-wording Mark N. suggests building a model of a bomb shelter. Mark makes a suggestion. Mike taps him on the head and says "No."
	Teacher tells girls that they are letting boys decide on the topic.	11:37	Teacher asks about branches of science in IGY. Mark raises hand but lowers hand when teacher calls on another student. Mark says that he has a National Geographic magazine after Richard comments on article on IGY in this magazine.
	Linda asks question on meaning of IGY.		Margaret says, "I want to study integration." Mark says, "Ditto."

CHART II
(Continued)

Situation	Stimulus Situation	Time	Behavior
	Discussion returns to list of topics. Teacher refers to Mark's earlier comment that list should be reduced rather than added to.	11:45	Mark raises hand while teacher talks of difficulty of choosing topic. Mark says, "I think a lot of things can be combined and re-stated." Mark raises hand again, but Clovis also has hand raised, and Mark says, "Go on, Clovis" and holds his own question until later.
	Richard and Mike argue with Clovis on undesirability of combining items 4 and 11 on list.		Richard and Mike state that the two items under discussion as possibility of a combination cannot be combined. Mark turns to Richard and wants to talk to the point but other students are talking. Mark raises hand and suggests a re-wording for a possible combined statement of items 4 and 11. Turns to Richard, says, "Would this be too large?" and reads his written question.
	Class dismissed.	11:58	Mark continues talking with Richard as students leave the room.

The core teacher described the progress of these boys during the selecting and planning phase of the unit as follows:

> ...Mike is one of the most vocal and dynamic members of the group, even more so than last year. Along with the qualities mentioned in the last year's letters, it has been apparent that with this increased confidence in himself and his leader status in the group, he has a tendency to talk "off the cuff" without first organizing his thoughts. Being able to think on one's feet is a valuable asset but carried to an extreme can also be a weakness. In a group discussion Mike sees the point so clearly and so quickly that he can kill enthusiasm by speaking too soon. As an individual he can and does use this ability to do a job in a fraction of the time necessary for most students and then delves more deeply into the subject, investigates some special aspect, or pursues an individual interest. The important point is that Mike knows all this and views the time gained as an opportunity to satisfy his curiosity, and never does he complain about too much work--rather, he demands more. This has tended to rub off on the rest of the group and the result is higher standards are the accepted thing.
>
> Mike's written work is seldom neat, not too surprising since he is careless, too, about his personal appearance. His reading has been exciting this fall. He has sampled Hemingway, Hersey, several of the great Russian writers, Steinbeck, Dickens. This is a decided change from last year. He has formed the excellent habit of asking Mr. Bateman for suggestions.
>
> Mike does superior work in the experimental class in linguistics which is part of the core block of time. It is here that his ability to deal with abstract ideas, to look at a problem in a new way, is especially apparent. Also apparent here is the tendency to let a rich imagination lead him astray when a bit of intellectual discipline might be more appropriate; however, perhaps this is too much to ask of an eighth grader...

> ...Mark continues to be an excellent class member socially and academically. He organizes himself so well that he can accomplish much more than most in the class. In addition he works with purpose and sets his standards very high. His intellectual curiosity plus his good work habits result in not only the desire to dig deeper into research problems but the opportunity to know how to do so. He is always demanding additional material, is not satisfied to investigate just one point of view, and views as a privilege the opportunity to do more work on a subject. His reading choices have been amazingly mature. While Steinbeck is his present favorite, he has sampled Hemingway, Hersey, Conrad, and some of the great Russians. He has continued to be the outstanding language student according to Mr. Bateman. Our current work with Mr. Bateman in rhetoric should be valuable for Mark

> since he and the rest of the eighth grade have grown less dramatically in this area. We are hoping that a disciplined approach plus the continued examination of the style of real writers will result in real progress. ...

The two boys, in their individual evaluations of the selection of the core unit, made the following comments on their own participation in this phase of unit:

> Mike: ...I participated in every discussion, did quite a lot of rewording, led two committee reports...was on the minority side in most discussions.
>
> I probably did a little too much quibbling with words. Didn't think out beforehand what I was going to say too much.
>
> Mark: ...One of the major things that challenged me in the choosing was that I had to think for myself and this should be stressed more often. ...
>
> Generally, I think my behavior was pretty good. I said most everything I had to say, although sometimes out of turn. One of my major problems is projecting my voice.

There seemed to be a fair degree of agreement, then, among the observers' view of the behavior of the selected students, the teacher's view, and the students' view. Just what this meant in relation to the model of talent was not so readily apparent, however.

Generally speaking, the observations (and inferences from them) seemed to validate the third dimension of the model--the individual and his orientation to the situation. (This dimension involved sensitivity to problems, involvement, and interaction with the problem.) It was more difficult to make even a tentative judgment concerning the other two dimensions--the individual and his internal frame of reference; and, the individual and his relation with others. It appeared that the description of the unusually talented individual and his relations with others more nearly fit one of the boys (Mark) than the other (Mike).

The matter of the individual's internal frame of reference was most troublesome. (This dimension included the view the individual has of himself, the set of values which give meaning to his action, and the intensity and direction of problem-centered activities.) Both boys seemed to exhibit considerable drive and energy as they participated in the activities of the class, but behaviors from which their concepts of self or their systems of values might be inferred were not quite so obvious.

Also, there was some question as to whether the selection of a unit was a broad enough framework within which to observe unusually talented students. Students who handle themselves in one way in this phase of a core unit might operate quite differently in the developmental or culminating phases. Similarly, since the development of a unit is just one of the responsibilities of the core program, it might be well to observe unusually talented students in some other activities as well. This might have been done by sampling more widely within the three hour block of time provided the core program at the junior high school level.

Summary

There was, on the basis of (1) faculty reactions, (2) observations of unusually talented students, and, (3) continued study of the literature, considerable question concerning the adequacy of the tentative model of talent. A model which focused more sharply on the behavior of talented individuals seemed to be in order. In the next part of this report the procedures used in reexamining and revising the model are described.

PART IV

REEXAMINING THE TENTATIVE MODEL OF TALENT

In Part III it was pointed out that the reactions of the University School staff and of other members of the Ohio State University faculty, observations of unusually talented students, and a continued study of the literature suggested that the tentative model was acceptable as a model of maturity but that there was considerable doubt as to whether it was also acceptable as a model of talent. An approach which focused more sharply on the behavior of talented individuals seemed to be indicated. In this section the procedures used in reexamining and revising the tentative model of talent are described. These include: (1) a more comprehensive survey of the literature--literature having a bearing on currect concepts of talent, categories of talent, and indications of talent; (2) small group discussions involving the University School faculty; and, (3) the solicitation of descriptions of the behavior of unusually talented individuals from authorities in the various disciplines (members of the Ohio State University faculty.) In the discussion which follows each of these procedures will be described.

A Survey of the Literature

The purpose of this section is threefold: first, to discuss briefly some current concepts of talent; second, to describe briefly the commonly used approaches in categorizing talents; third, to present a review of selected articles and books which describe indications of talent.

RL

Some Current Concepts of Talent

Even a casual survey of the literature reveals that the term talent means many things to many people. And, to add to the confusion, "talent" is just one of a number of terms currently employed in discussions of human potential. References to "the gifted", "the bright", "the superior", "the creative", "the academically talented", "the intellectually gifted" appear quite frequently. Closer scrutiny, however, suggests that there are four rather distinctive concepts underlying current discussions of the identification and development of talent. At the risk of oversimplification, these will be designated as: (1) the endowment concept, (2) the intellectual superiority concept, (3) the capacity-performance concept, and (4) the self-realization concept. A brief discussion of each follows.

① The Endowment Concept: Perhaps the most common interpretation of talent, particularly among laymen, is that the talented have been endowed with something that ordinary people do not have. The "gift" may be in science, mathematics, music, art, athletics, or dramatics--to name but a few of the possibilities. Talent is viewed as an innate something, and a person either has it or he doesn't. This point of view probably is not acceptable to psychologists, however. The general psychological conviction according to Guilford[1] seems to be that all individuals possess to some degree all abilities except for the occurrence of pathologies. In this sense, almost all individuals are talented. The most important concept here is the concept of continuity. Whatever the nature of talent may be, those persons who are unusually talented merely have more of what every individual has. Differences in talent are differences in degree rather than kind. It is this principle of continuity that makes it possible to pursue the study of talent in people who may not be talented to an unusual degree.

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[1] J. P. Guilford, "Creativity," The American Psychologist, V, 444-454 (September, 1950). See also Raymond G. Kuhlen and George B. Thompson, Psychological Studies of Human Development. New York: Appleton-Century-Crofts, Inc., 1952, Chapter 6.

Others concerned with the study of human behavior have stressed the point that unusual talent is not something one is born with which will develop on its own. It is a product of internal factors in the individual and an external environment which stimulates, motivates and provides opportunities for development.[2] In this connection Pressey suggests that the precocious genius exhibits especially clearly both innate capacities and developmental influences involved in extraordinary accomplishment. His thesis is:

> ...in attempting to account for notable precocity in such fields as music and athletics, too much stress has been put on presumed extreme constitutional genius and too little on a concomitance of favorable factors, operating in the growth years. Instances of great athletic skill emerging from efforts to overcome a seemingly crippling handicap seem to emphasize the potency of these last factors. Presumably, the original physical potentials of these individuals were good, although not manifest, before the handicap struck; but the great potential of favoring circumstances seems especially evident. In this connection, Wechsler's argument may well be recalled--that the range of human physical traits, as in height, strength, and quickness, is not really great, and that the range in mental capacities may be less extreme than is usually supposed. Rather, *superior original capacity, growing under a favorable concomitance of circumstances, develops into genius.*[3]

The same argument, he feels, applies in "sundry other and clearly intellectual fields"[4] as well.

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[2] See, for example, Ralph W. Tyler, "Meeting the Challenge of the Gifted," *The Elementary School Journal*, 58, 75-82 (November, 1957).

[3] Sydney Pressey, "Concerning the Nature and Nurture of Genius," *The Scientific Monthly*, 8, 124-125 (September, 1955).

[4] *Ibid.*, p. 125.

(2) The Intellectual Superiority Concept: The idea that talent is synonymous with high intelligence, or at least very closely related to it, has many staunch advocates. In fact, there has been a marked tendency in much of the research on talent to focus on individuals selected on the basis of their general intelligence as measured on tests. Terman, for example, whose work is perhaps the best-known and most influential, made a follow-up study of approximately 1500 California children selected on the basis of their scoring 140 or above on the Stanford-Binet test of mental ability. At the conclusion of the study he remarked that he was more convinced than ever that the I. Q. level is one of the most important facts that can be learned about any child.[5] In a lecture several years later he stated:

> ...Granting that both interest patterns and special aptitudes play important roles in the making of a gifted scientist, mathematician, mechanic, artist, poet, or musical composer, I am convinced that to achieve greatly in almost any field, the special talents have to be backed up by a lot of Spearman's g, by which is meant the kind of general intelligence that requires ability to form many sharply defined concepts, to manipulate them, and to perceive subtle relationships between them; in other words, the ability to engage in abstract thinking.[6]

He emphasized also that the evidence on early mental development of historical geniuses[7] and that obtained in follow-up studies of gifted children point to the conclusion that "capacity to achieve far beyond the average can be detected early in life by a well-constructed ability test that is heavily weighted with the g factor."[8]

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[5] For an over-all report of the Terman studies, see Lewis M. Terman and Melita H. Oden, The Gifted Child Grows Up. Genetic Studies of Genius, Volume IV. Stanford, California: Stanford University Press, 1947.

[6] Lewis M. Terman, "The Discovery and Encouragement of Exceptional Talent," The American Psychologist, 9, 224-225 (June, 1954).

[7] See, for example, Catharine M. Cox, and others, The Early Mental Traits of Three Hundred Genuises. Genetic Studies of Genius, Volume II. Stanford, California: Stanford University Press, 1926.

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Hollingworth, another pioneer in the field, also utilized mental superiority (a Stanford-Binet I. Q. of 130) as the primary criterion for selecting students for her experimental classes at Columbia University. However, emotional maturity, social adaptability, and physical fitness were also included among the minimum requirements for admission.[9] In some cases an even broader interpretation of talent has provided for the inclusion of individuals whose performance on tests of general intelligence places them in the upper 10 percent of the population. (120 I. Q. or above).[10] Some would include the top 15 to 20 percent of the nation's school population.[11] The significant factor in the identification of the talented, however, is still general intelligence, the lower limit being an arbitrary figure set largely as a matter of convenience. It is chiefly a question of how large a portion of a given population it is desired to include in the category of "talented". Non-intellective factors are seldom examined. Almost no attention is given to the total personality. It should be noted, of course, that while the question of where talent begins on a test score scale is highly debatable, there does seem to be some evidence of positive correlations between I. Q. as measured by an intelligence test and certain talents. The extent of the correlations, however, is unknown.[12]

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[8] Terman, op.cit., p. 225.

[9] See Leta M. Hollingworth, Gifted Children: Their Nature and Nurture. New York: The Macmillan Company, 1926.

[10] See, for example, How To Educate the Gifted Child. Committee on Exceptional Children and the Reporters of Exchange. New York: Metropolitan School Study Council, 1956; T. Ernest Newland, "Essential Research Directions on the Gifted," Exceptional Children, 21, 292-296+310 (May, 1955).

[11] See, for example, Ruth Wood Gavian (editor), The Social Education of the Academically Talented. Washington, D.C.: National Council for the Social Studies, 1958, p. vi.

③ The Capacity-Performance Concept: This interpretation of talent currently is gaining a considerable following. Talent is defined as capacity for outstanding achievement in some area of human endeavor.[13] Areas frequently mentioned include the academic fields such as science, mathematics, social science, and language; music and the arts - graphic, performing, and mechanical; and human relations. In some cases this broad definition has been qualified to suggest that the talented person is superior in some ability that can make him an outstanding contributor to the welfare of, and quality of living in, society.[14] In other cases, the distinction between potential talent and effective (manifest) talent is emphasized. Here, talent is viewed as consistently remarkable performance in any worthwhile type of human endeavor.[15] This interpretation tends to focus not only upon the ability of the individual but also upon his productivity. While it is not claimed that productivity is synonymous with talent it is held that unless there is a minimum of productivity, there is little probability that the individual really is talented.[16]

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[12] See Guilford, *op.cit.*, p. 446. Also see Terman, *op.cit.* Studies of historical genuises give additional evidence on this point. See Cox, *op.cit.*

[13] See, for example, A. Harry Passow, et.al., *Planning for Talented Youth*. New York: Bureau of Publications, Teachers College, Columbia University, 1955, pp. 5-6.

[14] See Robert F. DeHaan and Robert J. Havighurst, *Educating Gifted Children*. Chicago: The University of Chicago Press, 1957, Chapter I.

[15] See *Education for the Gifted*. The Fifty-seventh yearbook of the National Society for the Study of Education, Part II. Chicago: The University of Chicago Press, 1958, Chapter I. See also, Paul Witty, "How to Identify the Gifted," *Childhood Education*, 29, 312-316 (March, 1953). For a discussion of "manifest" and "potential" as applied to creativity, see Morris I. Stein, "A Transactional Approach to Creativity," *The University of Utah Research Conference on the Identification of Creative Scientific Talent*. Salt Lake City: The University of Utah Press, 1956, pp. 171-172.

④ The Self-Realization Concept: A fourth interpretation of talent is at variance with each of the three concepts briefly described above. This general theory about talent is a theory of the entire personality.[17] Talent is viewed as the style of engagement which each individual tends to use in his most rewarding fulfillment.[18] Talented individuals are fulfilling themselves--making full use of their potentialities. That is, these individuals are developing to the full stature of which they are capable. There is some question, however, whether this basic "fulfilling" is a sufficient condition of talent. Maslow,[19] in describing his study of self-actualizing people, points up this area of uncertainty:

> (self actualization) may be loosely described as the full use and exploitation of talents, capacities, potentialities, etc. Such people seem to be fulfilling themselves and to be doing the best that they are capable of doing...

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[16] Reports on the research on creativity being carried on at the University of Chicago suggest that unless there is some threshold of productivity there is little likelihood that the individual is creative. At the upper extremes of output, it is possible that high productivity may be at the expense of creativity and significance. See B. S. Bloom, "Report on Creative Research at the University of Chicago," The University of Utah Research Conference on the Identification of Creative Scientific Talent. Salt Lake City: The University of Utah Press, 1956, pp. 182-194. See Harold Pepinsky, "Productivity in the University," Personnel and Guidance Journal, 134-139 (November, 1956) for a description of a study of the identification and definition of productive behavior in college students.

[17] For a discussion of the psychological nature of aptitudes as related to personality theory, see Dean A. Allen, "Aptitudes and Personality," Harvard Educational Review, 26, 17-23 (Winter, 1956).

[18] For clarification of this concept see Ross L. Mooney's Report of Beginning Research on the Definition and Development of Creative Behavior. Columbus, Ohio: Bureau of Educational Research, The Ohio State University, 1954, 8 pp. (Mimeographed) and his A Preliminary Listing of Indices of Creative Behavior. Columbus, Ohio: Bureau of Educational Research, The Ohio State University, 1953, 11 pp. (Mimeographed). See also A. H. Maslow, "Self-Actualizing People: A Study of Psychological Health," Personality Symposium, 11-34 (1950).

[19] See Maslow, Ibid.

> This connotes also either gratification past or present of the basic emotional needs for safety, belongingness, love, respect, and self respect and of the cognitive needs for knowledge and for understanding or, in a few cases, "conquest" of these needs. ...It is still an open question as to whether this "basic gratification" is a sufficient or only a prerequisite condition of self-actualization. *It may be that self-actualization means basic gratification plus at least minimum talent, capacity, or "richness."*[20]

The issue involving the relationship of talent to psychological health is a difficult one to resolve. For, while the idea that to be talented is in some sense to be a fully developed, psychologically healthy individual cannot easily be dismissed, numerous examples to the contrary can readily be cited. There also seems to be some doubt whether the talented would more nearly realize their potentials if they were to become "perfect" models of psychological good health.[21] Questions of this nature, however, while the center of considerable controversy, have served to focus attention on what might be called a developmental approach to the study of human potentialities.

As is implied above, adherents of this position assume that all individuals potentially are talented. Differences in talent that exist among individuals are a matter of degree rather than kind. When viewed in relation to a continuum of talent, the unusually talented individual merely has more of what every individual has. Here, too, it is assumed that individuals affect and are affected by the environment in which they live. Talent is a dynamic thing which grows as the environment fosters it.

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[20] *Ibid.*, p. 12. Italics not in the original.

[21] For an excellent discussion of the relationship of creativity to psychological health see Frank Barron, "The Psychology of Imagination," *Scientific American*, 199, 150-166 (September, 1958).

Categories of Talent

One of the major tasks facing those concerned with the devlopment of a concept of talent is that of arriving at a set of categories into which talents fall. It is generally agreed that talents of many types are of great importance in modern society. Just what all of these varieties of talent are and how they might be classified is another matter, however. A review of the literature reveals that there are four essentially different approaches used in categorizing talents. These are:

1. Talents may be categorized in terms of the major disciplines.

   In much of the current literature talents seem to be categorized in terms of the major fields of knowledge. At least, it can be said that numerous publications dealing with talent in fields such as mathematics, science, art, social science, have appeared in recent years.[22]

2. Talents may be categorized in terms of areas of human endeavor.

   Passow,[23] for example, focuses on areas which have advanced civilization. He suggests that talent be defined operationally as capacity for superior achievement in some of the areas of human endeavor that have consistently made an outstanding contribution to human civilization: such academic fields as languages, social sciences, natural sciences, and mathematics; such art fields as music, graphic and plastic arts, performing arts, and mechanic arts; and the field of human relations.

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[22] See, for example, the literature on indications of talent reviewed later in this section.

[23] A. Harry Passow, et.al., Planning for Talented Youth. New York: Bureau of Publications, Teachers College, Columbia University, 1955, p.6.

3. Talents may be categorized in terms of abilities that can make the individual an outstanding contributor to the welfare of, and quality of living in society.

DeHaan and Havighurst[24] take the position that any ability that is both constructive and complex could be included. This, they claim, would exclude "only some simple mechanical abilities, such as finger dexterity, a useful ability important to a person in typewriting or wrapping packages, but a skill that does not mark a child as gifted unless it is combined with other abilities into something more complex."[25] They suggest that the following variety of gifts and talents be considered in developing a program for gifted children: (a) general intellectual ability (ability to think abstractly and do other kinds of relational thinking) and its various components, such as reasoning, verbal skill, mathematical skill, and spatial imagination; (b) ability in such useful areas as science, mechanics, social leadership, and human relations; (c) talent in creative arts, such as graphic art, music, creative writing, and dramatics.[26]

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[24] Robert F. DeHaan and Robert J. Havighurst, *Educating Gifted Children*. Chicago: The University of Chicago Press, 1957, pp. 1-2.

[25] *Ibid.*, p. 2.

[26] *Ibid.*

Similarly, Witty[27] and the committee which prepared Education for the Gifted, The Fifty-Seventh Yearbook of the National Society for the Study of Education,[28] used a broad definition of talent: "The talented or gifted child is one who shows consistently remarkable performance in any worthwhile line of endeavor."[29] They include not only the intellectually gifted but also those who show promise in music, the graphic arts, creative writing, dramatics, mechanical skills, and social leadership.

In a recent article, Mead[30] challenges the concept of giftedness as an inherited quality and advocates a broader concept which would include the many outstanding achievements of children that would otherwise receive no consideration. He defines giftedness as the unique qualities or abilities of an individual shown in his high level achievement and in the bases of that achievement. The qualities or abilities, he emphasizes, may be of many different kinds: intellectual, aesthetic, physical, spiritual, social, or economic.

A four-fold classification of abilities is suggested by

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[27] American Association for Gifted Children (Edited by Paul Witty), The Gifted Child. Boston: D. C. Heath and Company, 1951, especially Chapter 2.

[28] Education for the Gifted. Fifty-seventh Yearbook of the National Society for the Study of Education. Chicago: The University of Chicago Press, 1958.

[29] Ibid., p. 19.

[30] A. R. Mead, "Who Are The Gifted?" Education, 79, 3-7 (September, 1958).

Corey.[31] He is concerned not only with verbal ability which he feels is very important, but also with three other talents, scientific ability, artistic ability, and the ability to exercise constructive social leadership. All varieties of talent are not caught up in this classification, he admits, but many which are of importance today are included.

4. Talents may be categorized in terms of general intellectual ability or in terms of certain specialized abilities such as musical, artistic, mechanical.

In defining giftedness, the Educational Policies Commission interpreted this position quite clerarly:

> ...We usually mean general intellectual ability. The term is also used to cover certain specialized abilities which are widely regarded as varieties of giftedness. The varieties most clearly identified by psychologists are musical, artistic, and mechanical. Each of these three types of specialized ability has been found to vary quantitatively among different individuals. Each is similar to general intelligence in apparent constancy and function; yet none is closely related to intelligence.
>
> Several other specialized abilities--such as acting, oratory, poetry, mathematics, and linguistics--are popularly thought to be manifestations of special gifts. But psychologists usually regard them as functions of general intelligence channeled into specific areas by environmental circumstances, emotional conditioning, special interest, and training.[32]

Witty, in making much the same point, emphasized that in any program concerned with the identification of gifted children "it is important to develop methods of detecting individuals of high intellectual ability as well as those who exhibit special gifts in such areas as the arts, music, mechanics, science, social relations, leadership and organization."[33]

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[31] S. M. Corey, et.al., "Discovery of Outstanding Talent in Youth," Teachers College Record, 48, 260-268 (January, 1947).

[32] Educational Policies Commission, Education of the Gifted. Washington, D. C.: National Education Association, 1950, p. 37.

Recently a great deal of attention has been given to the academically talented student. Often he is described as intellectually gifted, possessing superior learning aptitude. Conant, however, in discussing the identification and education of the academically talented, uses the term to describe "all those pupils who have the ability to study effectively and rewardingly advanced mathematics, foreign languages, and tough courses in physics and chemistry."[34] This, he points out, is an operational definition. The percentage of a given high school population having such ability varies from community to community. He estimates that, on a national basis, probably somewhere between 15% and 20% of an age group can be so classified.

Indications of Talent

In this section selected books and articles for the period 1950-58 which describe "indices of talent" in various areas are reviewed. For each area which is surveyed an overview of the area is presented, and indications of talent are described. A brief statement of generalizations reached concludes the review of the literature in each area.

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[33] American Association for Gifted Children, op.cit., p.10.

[34] James B. Conant, "The Academically Talented Pupil," Journal of the National Education Association, 47, 218 (April, 1958).

The organization of this section parallels rather closely that found in the literature. Indications of talent are described in relation to the following areas,

1. Academic talent (general intellectual ability)
2. Science
3. Mathematics
4. Language Arts
5. Social Science
6. Art
7. Music
8. Dramatics
9. Dance
10. Mechanical Arts
11. Athletics
12. Leadership

ACADEMIC TALENT
(General Intellectual Ability)

In the current discussions of the conservation and utilization of human potential, a great deal of attention is being focused on individuals of high intellectual ability. The various authors who have contributed to the literature in this area emphasize that there is a lack of understanding of intellectually talented children and youth. Moreover, they appear to be in complete agreement that the intellectually talented are greatly neglected and that educational opportunities must be greatly improved. There is considerable variation, however, in the interpretation of intellectual talent.

Some define intellectual talent in terms of the upper one per cent of the school population.[1] In this case a minimum I.Q. of 136 obtained from scores on the Stanford-Binet Test frequently is used since it represents the top one percent of the juvenile population in general intelligence.[2] In some cases, a score of 130 on the Stanford-Binet Test is the arbitrary minimum.[3] The Hunter College Elementary School, an experimental center for developing a curriculum for gifted children, is an example of a school which has for some years selected students on the basis of high scores on the Binet test (usually 130 or above). However, each child's personal responsiveness also is evaluated before he is admitted.[4]

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[1] See, for example, The Intellectually Gifted. Reprinted from Special Education for the Exceptional. (Edited by Merle E. Frampton and Elena D. Call.) Boston: Porter-Sargent, 1956.

[2] Terman, who pioneered in the study of the gifted, selected subjects on the basis of their scoring 140 or above on the Stanford-Binet Test of Mental Ability. For an overall report of the Terman studies, see Lewis M. Terman and Melita H. Oden, The Gifted Child Grows Up. Genetic Studies of Genius, Volume IV. Stanford, California: Stanford University Press, 1947.

[3] See, for example, "The Gifted in Our Schools - A Symposium," School Executive, 78, 66-71 (September, 1958), especially "The Gifted Child and His Education," pp. 68-69.

At present, there seems to be a trend toward a broader interpretation of intellectual talent which provides for the inclusion of a larger group of individuals--perhaps the upper 10 percent of the school population. (120 I.Q. or above)[5] or even the top 15 to 20 percent.[6] In the latter case, the term "academically talented" frequently is employed. Students in this group are usually described as possessing superior learning aptitude. Conant suggests that academically talented be defined operationally so as to include "all those pupils who have the ability to study effectively and rewardingly advanced mathematics, foreign languages, and tough courses in physics and chemistry."[7] He estimates that, on a national basis, somewhere around 15% of an age group can be so classified. The significant factor, however, is still general intelligence as determined by performance tests of mental ability or inferred from various tests of achievement. The proportion of the student population included in the "intellectually talented" group is purely arbitrary. It seems to depend largely upon one's view of the size of the reservoir of talent from which leadership in the critical areas of human affairs will emerge.

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[4] For a description of the Hunter College Elementary School program, see Gertrude H. Hildreth, Educating Gifted Children at Hunter College Elementary School. New York: Harper and Brothers, 1952.

[5] See, for example, How To Educate the Gifted Child. Committee on Exceptional Children and the Reporters of Exchange. New York: Metropolitan School Study Council, 1956.

[6] See, for example, The Social Education of the Academically Talented. (Ruth Gavian, Editor). Washington: National Council for the Social Studies, 1958; and, James B. Conant, "The Academically Talented Pupil," N E A Journal, 47, 218-219 (April, 1958).

[7] Conant, Ibid., p. 218.

Indications of Academic Talent

Following World War II there was a renewed effort on the part of various individuals and organizations to awaken interest among school people and lay persons in conserving and utilizing human talents and resources. One of the most influential volumes dedicated to this purpose grew out of the efforts of the American Association for Gifted Children.[8] In discussing the identification of the gifted, the authors stress the importance of developing methods of detecting individuals of high intellectual ability as well as those who exhibit special talents in such areas as the arts, mechanics, and social relations. They take the position that while aptitude and achievement tests, reports of parents and teachers, age-grade status, accomplishment, and the like provide helpful data, tests of general intelligence are probably the most effective single instrument for identifying gifted children. The abilities possessed by intellectually talented children which are measured by tests of general intelligence are summarized as follows:

> Mentally gifted children have a high degree of general intelligence in the sense of the ability to do abstract thinking and other types of relational thinking. These children rate high in respect to the general intelligence factor which Spearman designated by the letter "G". In terms of Thurstone's theory they possess to a high degree most, if not all, of the eight primary mental abilities. According to Thorndike, they excel in the abilities involved in "abstract" intelligence.

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[8] American Association for Gifted Children (Edited by Paul Witty), The Gifted Child. Boston: D. C. Heath and Company, 1951.

> The mentally gifted are characterized by "power"--that is they are able to do mental tasks of a high degree of difficulty. This is what Thorndike meant by "level" in his discussion of the attributes of intelligence. Gifted children evidence "power" in the Revised Stanford-Binet tests, such as digits reversed, memory for sentences, vocabulary, and giving the meaning of abstract words.
>
> The mentally gifted are alert and quick. Spearman thought that intelligence and speed of response were not separable to any great degree. Thorndike gave speed as one of his attributes of intelligence. Most intelligence tests take at least some account of the factor of speed. The mentally gifted are also characterized by broad attention-span, by a high degree of insight into problems, and by the ability to generalize.[9]

Cutts and Mosely[10] also stress intellectual processes and achievements. However, they focus on characteristics readily discernible in the classroom rather than on abilities measured by tests. Among the characteristics discussed are: size of vocabulary and accurate use of words; ability to make generalizations; abstract thinking; insight into problems; reasoning; problem solving; speed of learning; speed of completing intellectual tasks; persistence; memory; foresight; humor and wit; range of interests and curiosity; alertness and keenness of observation; initiative; creative ability; critical judgment; and, desire to be of service.

In discussing intellectual ability and the identification of the intellectually talented, DeHaan and Kough[11] emphasize the importance of considering the genetic and environmental factors that influence mental growth before considering observational characteristics. They caution the reader that conclusions drawn from personal observations are readily influenced by interpersonal as well as environmental factors. Achievement, conformity, study habits, and various irrelevant personality factors often are given too much weight in attempts to evaluate intelligence on the basis of observations. Despite the dangers they point out, DeHaan and Kough suggest a number of specific characteristics which teachers might use in identifying intellectually talented students. Following is the list of identifying characteristics they propose:

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[9] Ibid., p. 14.

[10] Norma E. Cutts and Nicholas Mosely, Teaching the Bright and the Gifted. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1957.

[11] Robert F. DeHaan and Jack Kough, Identifying Students With Special Needs. Teacher's Guidance Handbook, Volume I. Chicago: Science Research Associates, 1956, Chapter 3.

> The student with intellectual ability:
> 1. Learns rapidly and easily.
> 2. Uses a great deal of common sense and practical knowledge.
> 3. Reasons things out. Thinks clearly. Recognizes relationships. Comprehends meanings.
> 4. Retains what he has heard or read without much rote drill.
> 5. Knows about many things of which most students are unaware.
> 6. Has a large vocabulary which he uses easily and accurately.
> 7. Can read books that are one to two years in advance of the rest of the class.
> 8. Performs difficult mental tasks.
> 9. Asks many questions. Has a wide range of interests.
> 10. Does some academic work one to two years in advance of the class.
> 11. Is original in his thinking. Uses good but unusual methods.
> 12. Is alert, keenly observant, and responds quickly.[12]

Oliver[13] also suggests that caution is necessary in identification. In discussing the identification of the academically talented he points out that the problem of identifying rapid learners is complicated by the fact that they fall into at least six different types which school people sometimes fail to analyze properly. "Only the first type--those who are mentally superior and achieving up to ability are easy to recognize,"[14] according to Oliver. He maintains that at least five other types should be looked for when planning identification procedures:

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[12] Ibid., pp. 22-23.

[13] See Albert I. Oliver, "Identifying the Academically Talented Pupil," *The Social Education of the Academically Talented.* (Edited by Ruth Gavian). Washington: National Council for the Social Studies, 1958, Chapter 2.

[14] Ibid., p. 13.

1. Mentally superior but doing inferior work, since asked to work at tasks offering too little challenge
2. Mentally superior but limited by emotional problems which interfere with learning tasks and social adjustment
3. Mentally superior but limited by inferior educational background
4. Mentally superior but limited by a too narrow range of interests or by attitudes of anti-intellectualism on the part of classmates
5. Mentally superior but achieving poorly because of poor reading ability. (The reading difficulty might be symptomatic of underlying emotional disturbance.)[15]

Oliver stresses that identification should be a continuous process and suggests that a combination of procedures be used, i.e., intelligence tests, achievement tests, cumulative records, sociometrics, films and pictures, autobiographies, clues from parents, and teacher judgment. He also lists significant characteristics of the academically talented. Among these are: a tendency to see relationships quickly; the ability to handle abstractions easily; a high level of verbalization; a tendency to be highly critical; a tendency to reflect upon the things they learn, to seek the "whys."

Similar lists of characteristics are presented by various authors.[16] Frequently, however, in discussing the characteristics of the intellectually talented, there is an attempt to summarize in terms of physical characteristics, mental characteristics, and social and emotional characteristics. In most cases these are not suggested as identifying characteristics but rather as characteristics of students identified as talented on the basis of I. Q. However, behavioral characteristics may be inferred from these. In How To Educate the Gifted Child,[17] for example, the New York Metropolitan School Study Council, drawing heavily on various research studies, suggests the following characteristics:[18]

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[15] Ibid., p. 13.

[16] See, for example, The Intellectually Gifted, op.cit. For a list of the characteristics of the young intellectually talented child see Paul Witty, "Who Are The Gifted?" Education for the Gifted. The Fifty-seventh Yearbook of the National Society for the Study of Education, Part II. Chicago: The University of Chicago Press, 1958, pp. 48-49.

> Intellectually gifted children, when compared with children in general, frequently demonstrate the following mental characteristics:
> 1. greater ability to make logical associations
> 2. longer attention span
> 3. greater originality in self-expression
> 4. more initiative
> 5. evidence of the power to generalize to a higher degree
> 6. deeper and more varied interests
> 7. vocabulary in excess of age level
> 8. greater degree of inquiring curiosity
> 9. greater ability to follow relatively complex directions
> 10. more reading in more areas for informational purposes
>
> In comparison with children in general, intellectually gifted children often give evidence of the following emotional characteristics:
> 1. greater degree of social adjustment
> 2. superior mental health
> 3. greater maturity in character development
> 4. more self-reliance
> 5. preference for older companions
> 6. giving way to boredom when confronted with repetition
> 7. more critical viewpoint of self and others
> 8. greater value for adult approval
>
> When intellectually gifted children are compared with children in general in their own age group, they are found to have the following physical characteristics:
> 1. taller than average for their age
> 2. stronger than their age group
> 3. healthier
> 4. more mature physically than their peers
> 5. better coordinated physically[19]

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[17] How To Educate the Gifted Child, op.cit.

[18] For a report on the research findings since about 1920 on physical, mental and emotional and social characteristics of gifted children, see Walter B. Barbe, "Characteristics of Gifted Children," Educational Administration and Supervision, 41, 207-217 (April, 1955). See also Marian Scheifele, The Gifted Child in the Regular Classroom. Practical suggestions for Teaching, No. 12. New York: Bureau of Publications, Teachers College, Columbia University, 1953, pp. 5-7.

[19] How To Educate the Gifted Child, op.cit.

The listing is intended to provide check-points that will be helpful to the teacher in the observation process. No one student, it is said, can be expected to manifest all of these characteristics to a significant degree.

In several discussions of characteristics, the interests manifested by intellectually superior children are described. Scheifele,[20] for example, points out that intellectually talented children studied in a number of situations have shown a tendency to prefer certain areas of reading and activity. In the field of reading, intellectually superior children prefer science, history, biography, travel, folk tales, informative fiction, poetry, and drama. They have less interest in adventure, mystery, and emotional fiction than do other children. They make frequent use of dictionaries, encyclopedias, atlases, and other compilations of classified information. The activities preferred by intellectually talented show a greater diversity of interest than do those of most other children. The hobbies that are most favored include collecting, playing musical instruments, and reading. Other interests actively pursued are dramatics, religious activities, scouting and campfire activities, debating, and study of ancient history.

What is probably the most thorough review of the research on the gifted is reported by Miles.[21] She presents the major findings chronologically down to the middle 1940's, giving considerable attention to the Terman studies. The developments in the period following the second

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[20] See Scheifele, op.cit.pp. 7-11.

[21] See Catharine Cox Miles, "Gifted Children," Manual of Child Psychology. (Edited by Leonard Carmichael). New York: John Wiley and Sons, Inc., 1954, Chapter 16.

World War are briefly surveyed. Findings on the characteristics of gifted children are reviewed in terms of racial origin, sex ratio, heredity and home background, physical traits and health history, school progress, school achievement, extracurricular pursuits and interests, play activities, and personal and social character traits.

In summarizing the traits of the gifted, Miles emphasizes that the various aspects of the background, development, interests, and achievements of gifted children are found to be clearly marked by superiority, characteristically greater the more the trait in question is correlated with intellect. Gifted children are superior specimens physically as well as psychologically, and they tend to express a superior energy in their activities. They come from better homes and in many cases have had better educational backgrounds and opportunities. However, Miles cautions the reader that superior environments and educational advantages do not insure the production of "crops" of gifted children. In capacity and accomplishment individual gifted children usually appear as unique and isolated individuals even against their superior backgrounds. We must, therefore, she concludes, believe that inheritance of gifted traits is individual and complex and that training can only develop, not create, gifted capacity.

The research reviewed by Miles indicates that there is no one-to-one correlation between intelligence and character traits. However, the evidence seems to demonstrate the better endowment of the gifted and their better training and development in social terms, as compared with average children. But, as Miles points out, techniques for precise measurement of causal relationships in this realm are not available to present-day research.

A recent report of a descriptive study of talented high school seniors has some relevance here also. In this study Holland and Stalnaker[22] developed a composite picture of the 556 National Merit Scholars of 1955-56. These "most promising students for college work" were selected primarily on the basis of scholastic achievement as estimated by high school rank and scholastic ability as measured by the Scholastic Aptitude Test. Their descriptions were developed on the basis of information obtained largely from a biographical questionnaire filled out by each student in the process of obtaining a scholarship, test scores, and statistical data accumulated in the selection of these students. No individual case studies were made.

In brief, the typical male scholar, as described by Holland and Stalnaker, is about 18 years of age, comes from a heavily populated state and a large high school graduating from 101 to 500 students per year. He possesses superior scholastic ability and especially quantitative ability. His socio-economic status is relatively high. He rarely comes from a large family. He plans to enter a scientific field after graduation from college. His hobbies and extra-curricular activities reflect a greater concern with things and intellectual problems rather than an emphasis in sociality or social activities. His life goals are characterized by his practical outlook on life, doing a competent job, achievement through working, desiring new experience, and dominance (leadership and supervisory roles). His motivation appears practical and directed at self-development and directed at securing new experience rather than an interest in people _per se_. This is not to say that the scholar is not concerned with human values and social activities, but rather his desire for intellectual and scientific problems and activities outweighs his concerns for social problems and events.

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[22] John L. Holland and Ruth C. Stalnaker, "A Descriptive Study of Talented High School Seniors: National Merit Scholars," _Bulletin of the National Association for Secondary-School Principals_, 52, 9-21 (March, 1958).

The typical female scholar differs in several respects. She is about 17 years of age. Her superior scholastic ability is weighted more toward the verbal. She plans to enter either a teaching or scientific field. Her hobbies and interests reflect a variety of intellectual and esthetic activities. She is more concerned with the arts and social activities, less concerned with physical activities and aggressive activities. She is concerned first with establishing a meaningful marriage and second with practical work goals. Her need for achievement is much less than that of the male. The other aspects of her composite picture, Holland and Stalnaker report, seem to be essentially the same as those for the male scholar.

In summary, there seems to be ample evidence that the intellectually talented are not the weaklings and misfits they were once thought to be. They are superior to children in general physically, intellectually, and socially and emotionally. As a group, however, they differ among themselves just as other children do. Most writers also emphasize that talent is a matter of degree not of kind and that no single trait possessed by intellectually talented children is peculiar to them alone. Among the most frequently mentioned behavioral characteristics of the intellectually talented are: unusual insight into problems; ability to handle abstractions; ability to see relationships quickly; ability to make generalizations; alertness and keenness of observation; verbal facility; critical judgment; persistence; and, originality.

SCIENCE

There are many suggestions in the literature for dealing with problems associated with identifying students with science potential and providing opportunities for their development. A number of questions remain unanswered, however. For example, is the talent necessary for success in science due solely to some special inherited ability or is talent in science a matter of high general intelligence coupled with the proper learning environment? Does science potential consist of a single ability or a complex pattern of abilities? Is talent in science basically the same as talent in other areas?--to name but three of the most controversial questions.

Some take the position that questions such as these are purely academic since the teachers in most schools do not have the time or facilities to seek out specific abilities in science _if_ they exist. The solution they suggest is relatively simple. Teachers _can_ identify students with high general intelligence who seem apt and interested in science. This position is reflected in _Education for the Talented in Mathematics and Science_.[1] In this report of the Joint Conference of the Cooperative Committee on the Teaching of Science and Mathematics of the American Association for the Advancement of Science and the U. S. Office of Education the term "talent in science" was interpreted so as to include students who are among the upper 20 percent of the students in general intelligence and who seem to be apt in science. However, certain factors closely related to success in science and mathematics were identified; and characteristics illustrative of those used successfully by many teachers in identifying the student with potential in science and mathematics, suggested.

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[1] _Education for the Talented in Mathematics and Science_. A report of a Joint Conference of the Cooperative Committee on the Teaching of Science and Mathematics of the American Association for the Advancement of Science and the United States Office of Education. Bulletin 1952, No. 15. U. S. Department of Health, Education, and Welfare, Office of Education, 1953.

Others insist that these questions must be dealt with if programs which will further the identification and development of talent are to be developed. And, there have been some studies which shed some light on these basic questions. One of the most well-known is that reported by Brandwein.[2] On the basis of some twenty years of first-hand observation of working scientists and students with "high promise of contributing to science," he concluded that science talent (which he prefers to call high level ability or developed ability in science) is not a specific factor, but emerges out of general intelligence. It is a combination of intellectual abilities, inherited and developed and its expression is directly related to the early opportunities available for involvement in science. The only difference between high level ability in science and in other areas, according to Brandwein, is in the genetic factor.

Psychologists too, have continued to focus attention on the nature of scientific ability. The findings appear to be somewhat contradictory, however. Peel,[3] for example, in summarizing recent British research concludes that research findings do not lend much support to the view that there is a well-defined special ability in science. Guilford,[4] however, in discussing the nature of creative abilities makes it quite clear that he does not subscribe to the concept that creative ability is the same wherever you find it. Rather, he contends, what it takes to make the scientist, the artist, the writer, the composer creative may have some factors in common, but there is much room for variation in the pattern of abilities. The conclusions Guilford[5] reached on the basis of his work on factors of intellectual ability and their relation to creative scientific ability have relevance here also. These were that scientific aptitude is a many-sided phenomenon, involving many different abilities, depending upon the science and the particular steps within the science; and, that most of the differences in what scientists are able to do can be accounted for in terms of intellectual factors. Such research and theorizing have provided many clues as to the nature of scientific potential but much more is needed. There is a rather surprising dearth of research in this area.

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[2] See Paul F. Brandwein, The Gifted Student as Future Scientist. New York: Harcourt, Brace and Company, 1955.

[3] E. A. Peel, "Psychology and the Teaching of Science," British Journal of Educational Psychology, 25, 135-144 (November, 1955).

[4] J. P. Guilford, "Creativity," The American Psychologist, 5, 444-454 (September, 1950).

Indications of Scientific Talent

The Mature Scientist

A number of studies of the mature scientist are reported in the literature. For the most part, these involve individual case studies, intensive studies of groups of eminent scientists, or comparative studies of scientists and non-scientists. In any event, the attempt seems to be to arrive at a set of attributes or traits which characterize the high level scientist.

Ragazzini,[6] for example, describes the contributions, life, and characteristics of Edward H. Armstrong whom he characterizes as the most important creative thinker and inventor of all time in the field of radio. He describes Armstrong's chief characteristic as being a tenacity, an intense, indefatigable and thorough pursuit of his major interest from boyhood on, while still leading a normal, active social life. He also notes Armstrong's fantastic capacity to think in physical terms, skill in human relations with his co-workers, and youthful enthusiasm. In writing of the chemist Wilhelm Ostwald, Farber[7] stresses a deep driving conviction which also resulted in persistence against odds. This conviction was based upon deep experiences of reaction with a super-individual force. In such experiences, natural laws or relationships were perceived at times in a sudden illumination or "an almost physical sensation in my brain" as Ostwald himself once described it. According to Farber, to be capable of such deep experiences, to be subjected to them, to embrace them as compelling and revealing is a common trait of scientific genius. The scientific genius is also characterized by a strong identification of self with the system of science in which he is absorbed and by the ability to note the common features of observations.

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[5] J. P. Guilford, "The Relation of Intellectual Factors to Creative Thinking in Science," _The 1955 University of Utah Research Conference on the Identification of Creative Scientific Talent._ Salt Lake City: The University of Utah Press, 1956, pp. 69-95.

[6] John R. Ragazzini, "Creativity in Radio," _Journal of Engineering Education_, 45, 112-119 (October, 1954).

Perhaps the best-known study of scientists is that carried out by Roe.[8] During her five years of research she tried to determine the attributes of a group of 64 eminent scientists and the reasons why they chose their field of work. Among the group studied were 20 biologists, 22 physicists, and 22 social scientists (psychologists and anthropologists). Each was examined exhaustively by long personal interviews and tests. In reporting her findings Roe stressed that there is no such thing as a typical scientist. Eminent scientists differ greatly as individuals, and there are well-marked group differences between the biologists and the physicists, and between the natural scientists and the social scientists. Certain common patterns do appear, however, she contends, in the group as a whole; and the most convenient way to summarize these generalizations is to try to draw a picture of what might be called the "average" eminent scientist.

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[7] Eduard Farber, "A Study in Scientific Genius," Journal of Chemical Education, 30, 600-604 (December, 1953).

[8] Anne Roe, "A Psychologist Examines 64 Eminent Scientists," Scientific American, 187, 21-25 (November, 1952). For a complete account of this study see Anne Roe, The Making of a Scientist. New York: Dodd, Mead & Co., 1952.

> He was the first-born child of a middle-class family, the son of a professional man. He is likely to have been a sickly child or to have lost a parent at an early age. He has a very high IQ and in boyhood began to do a great deal of reading. He tended to feel lonely and "different" and to be shy and aloof from his classmates. He had only a moderate interest in girls and did not begin dating them until college. He married late (27), has two children and finds security in family life; his marriage is more stable than the average. Not until his junior or senior year in college did he decide on his vocation as a scientist. What decided him (almost invariably) was a college project in which he had occasion to do some independent research--to find out things for himself. Once he discovered the pleasures of this kind of work, he never turned back. He is completely satisfied with his chosen vocation. (Only one of the 64 eminent scientists--a Nobel prize winner--says he would have preferred to do something else: he wanted to be a farmer, but could not make a living at it.) He works hard and devotedly in his laboratory, often seven days a week. He says his work is his life, and he has few recreations, those being restricted to fishing, sailing, walking or some other individualistic activity. The movies bore him. He avoids social affairs and political activity, and religion plays no part in his life or thinking. Better than any other interest or activity, scientific research seems to meet the inner need of his nature.[9]

There are, as Roe points out, many differences among and within the subgroups. One of the most striking differences is in the area of social relationships. The natural scientists tend to present a shy, lonely, over-intellectualized picture, whereas the social scientists are much more outgoing and socially active. The one thing that all of the 64 scientists have in common is their driving absorption in their work. They have worked long hours for many years because they would rather be doing their work than anything else. The most important single factor in the making of a scientist, Roe hypothesizes, is the need and ability to develop personal independence to a high degree.

In his studies of scientists, Strauss[10] focuses attention on non-intellectual factors. He takes the position that although general intelligence is an important factor in scientific research, it is not the only factor. He cites two studies in support of his thesis. First, he describes his study of 89 physical scientists, 38% of whom had IQ records in high school below 120. Second, he reports that more than 80% of a group of 60 biological and social scientists he studied indicated that they considered an average intelligence sufficient for scientific research. They suggested a number of other factors as being as important or more important than intelligence for doing scientific research. Among these were: perseverance, interest, training, interest in people, ability to see relationships, hard work, curiosity, intellectual honesty, rigorousness, open-mindedness, imagination, personality, skill in writing and speaking, and good memory. The dominant force that shaped the lives of these 169 scientists, Strauss generalizes, was drive. Other important factors were a degree of nonconformity and the effect of personal interest taken in them by others.

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[9] Ibid., p. 22.

[10] Samuel Strauss, "Looking Backward on Future Scientists," The Science Teacher, 24, 385-387 (December, 1957).

Several comparative studies also suggest some attributes of scientists as well as differences between scientists and non-scientists. For example, a comparative study of the men in the well-known group of the gifted followed up by Terman and his associates[11] indicated that the men who were classified in the science groups showed from childhood consistently higher aptitudes in science, lower interests in business, and lower scores in social relations. McClelland[12] analyzed responses of scientists, salesmen, and subjects with high achievement motivation to the Strong Vocational Interest Blank and found a common interest in risk-taking situations. This, he uses in support of his hypothesis that the calculated risk is an aspect of scientific performance, that the successful scientist--like the successful business man--has a great need for achievement.

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[11] Lewis M. Terman, "Are Scientists Different?" Scientific American, 192, 25-29 (January, 1955).

[12] David C. McClelland, "The Calculated Risk: An Aspect of Scientific Performance," The 1955 University of Utah Research Conference on the Identification of Creative Scientific Talent. Salt Lake City: The University of Utah Press, 1956, pp. 96-110.

Studies of the nature of creativity have in some cases focused on creativity in science. Guilford,[13] for example, with certain types of creative people in mind--the scientist and the technologist, hypothesized that creativity involves factors such as sensitivity to problems, ideational fluency, flexibility of set, ideational novelty, synthesizing ability, analyzing ability, reorganizing or redefining ability, span of ideational structure and evaluating ability. He suggests that similar hypotheses be formulated and factorial research carried out in other areas of creativity. Barron[14] theorizes that creative potential is directly a function of freedom and that the objective freedom of the individual is at a maximum when the self is sufficiently secure to permit complete identification with the not-self. He proposes the following statements as descriptive of creative scientists as well as of creative artists:

> Creative people are especially observant, and they value accurate observation (telling themselves the truth) more than other people do.
>
> They often express part-truths, but this they do vividly; the part they express is the generally unrecognized; by displacement of accent and apparent disproportion in statement they seek to point to the usually unobserved.
>
> They see things as others do, but also as others do not.
>
> They are thus independent in their cognition, and they also value clearer cognition. They will suffer great personal pain to testify correctly.

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[13] J. P. Guilford, "Creativity," *The American Psychologist*, 5, 444-454 (September, 1950).

[14] Frank Barron, "The Psychology of Imagination," *Scientific American*, 199, 150-166 (September, 1958).

> They are motivated to this value and to the exercise of this talent (independent, sharp observation) both for reasons of self-preservation and in the interest of human culture and its future.
>
> They are born with greater brain capacity; they have more ability to hold many ideas at once, and to compare more ideas with one another--hence to make a richer synthesis.
>
> In addition to unusual endowment in terms of cognitive ability, they are by constitution more vigorous and have available to them an exceptional fund of psychic and physical energy.
>
> Their universe is thus more complex, and in addition they usually lead more complex lives, seeking tension in the interest of the pleasure they obtain upon its discharge.
>
> They have more contact than most people do with the life of the unconscious--with fantasy, reverie, the world of imagination.
>
> They have exceptionally broad and flexible awareness of themselves. The self is strongest when it can regress (admit primitive fantasies, naive ideas, tabooed impulses into consciousness and behavior), and yet return to a high degree of rationality and self-criticism. The creative person is both more primitive and more cultured, more destructive and more constructive, crazier and saner, than the average person.[15]

Various attempts to compare and synthesize the attributes characterizing scientists as they emerge from different independent studies have been made. The report of the Personality Committee of the 1955 University of Utah Research Conference on the Identification of Creative Scientific Talent,[16] for example, presents a description of scientists based on review of pertinent research. Twenty-four attributes derived from an analysis of selected studies were organized into seven groupings which seemed to represent focal and agreed-upon characteristics of scientists in general, especially research scientists in the physical sciences. These were: (1) a liking for manipulation of ideas, (2) the general quality of impulse control, (3) a low level of interpersonal involvement in human relations, (4) a devotion to independence and autonomy, (5) tolerance for ambiguity and the capacity to defer closure, (6) a liking for things and a preoccupation with the physical universe, and (7) low projectivity, or a high commitment to secondary thought processes.

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[15] See *Ibid*., p. 164.

[16] Robert H. Knapp, "Personality Committee Report," *The 1955 University of Utah Research Conference on the Identification of Creative Scientific Talent*. Salt Lake City: The University of Utah Press, 1956, pp. 229-241.

In general, there seems to be agreement that the mature scientist is characterized by a high general intelligence but that certain non-intellectual factors such as independence, intellectual honesty, and open-mindedness are also important in the development of a scientist. The one thing that scientists seem to have in common is a deep, driving, intense absorption in their work. A closely related area on which there is general agreement centers around the energy, hard work, and persistence that scientists exhibit. There is little agreement in the area of social relations, however. Some researchers point out that the scientist's social life and activity arenormal, but the majority seem to report a rather low level of interpersonal relations.

The Potential Scientist

There are, in the literature, a number of descriptions of the potential scientist and suggestions for identifying him. Some of these are based on careful research studies, but the majority seem to represent a pooling of teachers' observations in the classroom.

One of the most widely quoted studies of the future scientist is that reported by Brandwein.[17] His conceptual scheme, based largely on observations of promising science students, is quite useful in thinking about high level ability in science. He hypothesized that high ability in science is based on the interaction of several factors--Genetic, Predisposing, and Activating--no one of the factors being sufficient in itself. The Genetic factor includes characteristics such as high level verbal and mathematical ability, and adequate sensory and muscular control. The characteristics grouped under the *Predisposing* factor consist of two major ones: persistence and questing. And, the *Activating* factor is concerned with environmental influences such as the opportunities for advanced training with an inspirational teacher. Brandwein maintains that the only difference between high level ability in science and in other areas is the genetic factor.

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[17] See Brandwein, op.cit.

Bloom,[18] agreeing with Brandwein that high level ability in science is a function of high general ability, suggests a composite list of traits which are most frequently found in talented students. These include: high general intelligence; high verbal comprehension; superior vocabulary; intellectual curiosity and imagination; the ability to assimilate and generalize; objective self analysis; persistence; and, an insight that is often truly remarkable.

DeHaan and Kough[19] also emphasize that a major characteristic of an able scientist is a high degree of intelligence. In addition, the future scientist must have a greater than average persistence in working out problems and a strong curiosity that impels him to search for the answers to scientific questions. The authors caution the reader that interest in science is not always equated with ability and that it often takes very careful observation to identify those with science abilities. They do, however, suggest a number of characteristics intended to aid teachers in identifying scientific ability.

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[18] Samuel W. Bloom, "The Early Identification of Potential Scientists," *School Science and Mathematics*, 55, 287-295 (April, 1955).

[19] Robert F. DeHaan and Jack Kough, *Identifying Students With Special Needs*. Teacher's Guidance Handbook, *Secondary School Edition, Volume I*. Chicago: Science Research Associates, 1956, pp. 29-31.

The student potentially talented in science:

1. expresses himself clearly and accurately either through writing or speaking.
2. reads one to two years ahead of his class.
3. is one to two years ahead of his class in mathematical ability.
4. has greater-than-average ability to grasp abstract concepts and see abstract relationships.
5. has good motor coordination, especially eye-hand coordination. Can do fine, precise manipulations.
6. is willing to spend time beyond the ordinary assignments or schedule on things that are of interest to him.
7. is not easily discouraged by failure of experiments or projects.
8. wants to know the causes and reasons for things.
9. spends much of his time on special projects of his own, such as making collections, constructing a radio, making a telescope.
10. reads a good deal of scientific literature and finds satisfaction in thinking about and discussing scientific affairs.[20]

Similar lists of identifying characteristics are presented by a number of authors.[21] In Education for the Talented in Science and Mathematics[22] it is also suggested that certain factors closely related to success in science and mathematics might be identified by the use of standardised tests. These factors include: quantitative reasoning, verbal comprehension, mechanical reasoning, abstract reasoning, spatial visualization and interest.

Some writers include a number of characteristics in a kind of portrait.

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[20] See Ibid., p. 30.

[21] See, for example, Paul A. Witty, "Who Are The Gifted?" Education For The Gifted. Fifty-seventh Yearbook of the National Society For The Study of Education, Part II. Chicago: University of Chicago, 1958, Chapter III; Paul A. Witty and Samuel W. Bloom, "Science Provisions For The Gifted," Exceptional Children, 20, 244-250 (March, 1954); Education for the Talented in Mathematics and Science, op.cit; and "Education of the Academically Talented Secondary School Pupil in Science," The Identification and Education of the Academically Talented Student in the American Secondary School. Washington: National Education Association, 1958, pp. 109-116.

[22] Education for the Talented in Mathematics and Science, Ibid.

Meister,[23] for example, in discussing the specialized high school, presents "a generalized profile of a typical student in the High School of Science in Bronx, New York:"

> He wants to go to college and make science his career; however, he is not too definite in his interest. He is a year younger than the average high school student of the same grade; but he knows the fundamentals of arithmetic and spelling. He reads extensively in many kinds of books and periodicals. He is alert to current issues and is capable of profound loyalties. He complains about too much homework but puts a considerable amount of time on daily study. He spends much spare time in his home laboratory and on other hobbies. Because he is eager and vocal, he is sometimes difficult to control in class. He is hard on the teacher and can spot at once the one who "doesn't know his stuff." He has achieved an early sophistication in the importance of marks and is aware of short cuts to high grades. His mental and physical health is excellent. He welcomes the advent of girls with typical adolescent enthusiasm. Though young, he is proficient in athletics, participating in and supporting baseball, soccer, swimming, basketball, tennis, handball, and track. He may work after school and during the summer. He joins many clubs. His IQ is exactly at the median for the school; it is 140! He offers his teachers the greatest possible challenge, spiritually and professionally.[24]

Considerable research has been undertaken to determine the characteristics of the gifted scientist; however, a substantial portion of this has been concerned with the mature scientist. MacCurdy,[25] who contends that the studies describing the mature scientist contain few of the characteristics of the embryo scientist, conducted a comprehensive study resulting in an impressive compilation of data which describe the Science Talent Search Winners for 1952 and 1953. Since 94% of the winners of the Talent Search followed their occupational choice and became scientists, engineers, and professional people, it appears that these were a group of scientists, yet in the embryo state, who were well worth studying. The entire group of

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[23] Morris Meister, "A High School of Science For Gifted Students," The Gifted Child. Boston: D. C. Heath and Company, 1951, Chapter 10.

[24] Ibid., p. 222.

[25] Robert Douglas MacCurdy, "Characteristics of Superior Science Students and Their Own Sub-groups," Science Education, 40, 3-24 (February, 1956).

504 was divided into five sub-groups, somewhat on the basis of their occupational choice: scientific scholars (the top winners), potential scientists, potential engineers, women in science, and potential professional people. On the basis of their responses to a detailed questionnaire, composite portraits which describe the personality, attitudes, interests, activities, family history, associates, science teacher, and decision for science of the entire group and of the five sub-groups were developed. Following is the portrait of the superior science students (the entire group):

> Personality. Leadership, self control and self discipline, not gregarious, curious, rational, persistent, intellectually complex.
> Attitudes and Opinions. Suspended judgment, truth from empirical evidence, recognizes interdependence of science and society.
> Interests. Non-athletic, non-public entertainment, solitary, intellectual, mechanical, scientific.
> Activities. Socially limited, scholarly, scientific, active, and competitive in science.
> Family History. Stable, cultured, educated, economic advantages, leisure time, democratic.
> Associates. Strongly influenced, contact with scientist, scientific activities with friends, scientific friends, recognized interdependence of self and associates in science.
> Science Teacher. Father figure, good personality, well trained, experienced, professional attitude, permissive and progressive educator, good example to imitate.
> Decision To Be Scientist. Very early, motivated by interest and success. Love of humanity can be expressed in it.[26]

MacCurdy concluded that there are four basic factors in the metamorphosis of a scientist: capacity, interest, scientific influences, and freedom--the combination of all of these producing a young person he characterizes as "the beloved egghead".[27]

A report of a study by Bull,[28] who used the case history approach to study the activities and backgrounds of 100 high-school students identified by their teachers as having dominant science interests, emphasizes that the large majority of these students were found to be superior in scholastic ability to other students in the same school. All the members of the group were readers of science literature, and about three-fourths of the students studied had a preference for physical science. Approximately 60 percent of the students were inclined to avoid the usual physical activities found in the typical secondary school. Nearly all, however, seemed to have good social poise and were not classified as unusual in social behavior.

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[26] *Ibid*., pp. 23-24.

[27] Robert D. MacCurdy, "Metamorphosis of a Scientist," *The American Biology Teacher*, 19, 19-20 (January, 1957).

[28] See Herbert A. Smith and Nathan S. Washton, "Science in the Secondary Schools," *Review of Educational Research*, 27, 343-355 (October, 1957).

On the whole, there seems to be agreement that the student potentially talented in science has a high or at least an above-average general intelligence. Other characteristics closely related to intellectual ability, e.g., high verbal ability, above average mathematical ability, extraordinary memory, and remarkable insight, are frequently mentioned also. High intelligence, however, while recognized as a basic factor in scientific ability, is not generally considered to be the only factor. The high-level ability science student is also likely to manifest considerable persistence and drive, strong science interests, and a high degree of intellectual curiosity. The realization of science potential seems to depend not only on intellectual ability but also certain personality characteristics coupled with the necessary environmental influences.

MATHEMATICS

A review of some of the pertinent literature in this area reveals that talent in mathematics is commonly interpreted so as to include the students who are among the upper 20 percent of the student population in general intelligence and who seem apt in mathematics.[1] In some cases an I. Q. above 120 is cited as an indication of mathematical ability.[2] There is considerable difference of opinion, however, as to whether the talent necessary for success in mathematics is due solely to some special inherited ability or to high general intelligence plus the proper learning environment.[3] And, to further complicate the issue, there seems to be little agreement as to whether mathematics potential consists of a single ability. Some writers refer to the possibility of a special inherited ability without which the student may find mathematical learnings difficult. Others emphasize that mathematics potential consists of a complex pattern of specific abilities.[4] For example,

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[1] See Education for the Talented in Mathematics and Science. A report of a Joint Conference of the Cooperative Committee on the Teaching of Science and Mathematics of the American Association for the Advancement of Science and the U. S. Office of Education, Bulletin 1952, No. 15. Washington: U. S. Department of Health, Education, and Welfare, Office of Education, 1953. See also Earl M. McWilliams and Kenneth E. Brown, The Superior Pupil in Junior High School Mathematics. Bulletin 1955, No. 4. Washington: U. S. Department of Health, Education, and Welfare, Office of Education, 1955.

[2] See, for example, Howard F. Fehr, "The Student Gifted in Mathematics," N. E. A. Journal, 43, 22 (April, 1954).

[3] For a brief discussion of this controversy see Education for the Talented in Mathematics and Science, Ibid.

[4] See Ibid. See John R. Hills, The Relationship Between Certain Factor-Analyzed Abilities and Success in College Mathematics. Reports from the Psychological Laboratory, The University of Southern California. Los Angeles: The University of Southern California, 1955, for a review of pertinent literature.

Lee[5] concludes that ability to succeed in mathematics corresponds to the ability to carry out four processes - recognition of variables, classification, ordering, recognition of correspondences - while dealing with arithmetic numbers, algebraic symbols and spatial figures. The results of Hills'[6] study, however, suggest that there is no straightforward approach to the problem of finding those with high potential in mathematics. In fact, he concludes that "there may be no unique trait or constellation of traits which can be called mathematical aptitude."[7]

Indications of Mathematical Talent

Despite the difficulties involved in clarifying a concept of the nature of talent in mathematics, a number of recommendations for identifying the talented appear in the literature. For the most part, these methods might be classified as (1) formal, those involving the use of standardized tests, or (2) informal, those primarily involving teacher judgment. For example, in _Education for the Talented in Mathematics and Science_[8] it is suggested that standardized tests might be particularly useful in identifying certain factors closely related to success in mathematics. Among these factors are: quantitative reasoning, verbal comprehension, abstract reasoning, spatial visualization, and interest. In another section of this bulletin, characteristics such as extraordinary memory, intellectual curiosity, persistency, insight into abstraction, the ability to do abstract thinking on a high level, the ability to translate data into generalizations, and the ability to apply knowledge to new situations are suggested as illustrative of those used successfully by many teachers in identifying the student with outstanding ability in mathematics.

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[5] Doris M. Lee, "A Study of Specific Ability and Attainment in Mathematics," _British Journal of Educational Psychology_, 25, 178-189 (November, 1955).

[6] For a brief description of this study, see John R. Hills, "Can We Find the Latent Scientists?" _School and Society_, 85, 306-308 (October, 1957).

[7] _Ibid._, p. 306.

[8] _Education for the Talented in Mathematics and Science_, _op.cit._, pp. 3-4. See also McWilliams and Brown, _op.cit._

McWilliams and Brown[9] discuss essentially the same factors. However, it is important to note two additions to the list of distinguishing characteristics - creativeness and fluency of communication. Fehr[10] also stresses that extraordinary memory, ability to generalize, intellectual curiosity, persistent goal-directed behavior, keen quantitative insight, facility in reasoning, and an unusually advanced knowledge of mathematics as well as a fairly high general intelligence are indications of possible mathematical ability. Elder[11] suggests that in trying to spot the gifted the teacher keep in mind that the gifted child has: unusual, perhaps odd, interests; a rich associative background; quick understanding; a retentive memory; insatiable curiosity; ability to discover and grasp several ways of solving the same problem; ability to generalize; a longer attention span than others in the class; and, more interest in challenging units of work than in short specific assignments. She also points out that the gifted child tends to dislike large amounts of routine and drill and may neglect dull, practice homework assignments. He may even give evidence of unsatisfactory adjustment to the school program, such as undesirable work habits, day dreaming and frequent idleness, poor grades and mediocre work, resentment of authority, intolerance, indifference and open distaste for school.

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[9] McWilliams and Brown, op.cit.

[10] Fehr, op.cit.

[11] Florence L. Elder, "Providing for the Student with High Mathematical Potential," The Mathematics Teacher, 50, 502-506 (November, 1957).

On the whole, there seems to be general agreement among those suggesting means for identifying students potentially talented in mathematics that general intelligence is just one indication of possible mathematical ability. Facility in quantitative reasoning, a high degree of intellectual curiosity, persistence, ability to generalize, and ability to apply knowledge to new situations are among the other factors commonly related to success in mathematics. Insight into abstractions and the ability to do abstract thinking on a high level are mentioned frequently. Further, the talented or potentially talented student is characterized as having a long attention span, a high degree of interest and a quick understanding as well as an extraordinary memory. In addition, he is said to have a certain creativeness and fluency of communication. As might be expected, these characteristics seem to result in the student's increased accomplishment and knowledge in mathematics, although he may not always receive high grades due to lack of proper motivation and/or instruction.

LANGUAGE ARTS

There seems to be relatively little emphasis on the identification of the student talented in some or all phases of the language arts as indicated by a review of recent literature in this field. (Here, it is assumed that reading, writing, speaking, and listening comprise the language arts. For purposes of this study, foreign language is also included in this category.) The major focus seems to be on the development of language arts programs appropriate for the intellectually talented.

In the literature which does have some relevance to indications of talent in the language arts, descriptions of the talented writer appear quite frequently. For the most part, however, these are descriptions of the mature writer. Very few suggestions for identifying the potentially talented writer are found. The reading interests and development of the intellectually gifted child are described rather frequently, and an occasional reference is made to talent in English. But, very few descriptions of the student unusually proficient in foreign language occur in the literature. On the whole, there seemed to be a rather limited number of sources on which to draw in this area.

Indications of Talent in the Language Arts

Writing:

Some characteristics of the unusually talented writer may be inferred from the comments of successful authors as they address the prospective or beginning writer as well as the general reader. Cowley,[1] for example, states that in vocational terms, the writer is a person for whom writing is the central activity and that his consciousness of having readers helps to determine his social character. This inherent alertness to readers causes the writer to want always to be heard or read. In psychological terms, the writer is a person who keeps trying to find the exact and meaningful words for any situation because he believes that such words have a magic power. It is this word-mindedness, Cowley believes, that distinguishes writers from scholars and intellectuals or speculative thinkers who deal primarily with facts and ideas.

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[1] Malcom Cowley, "What Writers Are and Why," New Republic, 31, 16-17, (October 4, 1954).

A somewhat different approach to describing the writer as a person was used by Sullivan who distinguishes between the casual writer, the "born" writer, and the genius.[2] Sullivan notes that the person who feels he is born to write is more likely to have his ego closely tied up with his writing which often causes tenseness. The characteristics of the born writer are implied in the questions advanced by Sullivan. From these questions it can be inferred that the "born" writer ordinarily has learned to read early as well as to compose rhymes and write little stories. Also implied is that the "born" writer is an avid reader who reads anything and everything and has a strong interest in names and places. Sullivan also reminds the "born writer" that true writing talent buds early but often blooms late.

Hunt[3] maintains that the article writer is a breed apart from other kinds of writers. The article writer writes not for art's sake, but for the sake of human beings. Though he works hard, he is, by and large, fluent in his medium, comfortable with his technique, and generally pleased by the day-to-day exercise of his skills. Further, he is simply not a solitary type, being anything but a recluse. The article writer is distinguished by his desire to experience many things and by his enthusiasm for passing his experiences along to others. What he loves about his profession more than the exercise of verbal talent, more than the life of an independent creator, is the learning-teaching process. Writing is, therefore, not so much a valuable emotional experience for him as a vehicle for telling someone else what he has learned. These observations by Hunt, while somewhat apart from a description of indices of talent, do tend to direct attention to specific kinds of writing talent as well as to the writer's personal characteristics.

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[2] Hazel Sullivan, "Were You Born to Write," The Writer, 66, 376-378 (November, 1953).

[3] Morton M. Hunt, "What Is An Article Writer?" The Writer, 70, 12-13 (February, 1957).

In discussing writing ability and the identification of students with writing talent, DeHaan and Kough[4] stress the importance of making a clear distinction between practical writing and creative writing. They point out that in practical writing--business letters, memos, reports, and the like--correct form, spelling, and grammatical construction must be emphasized. In creative writing, however, the emphasis should be on freedom, unusual expression, experimentation, and original thought. They suggest that in looking for creative writers the focus be on the spirit and freedom of what is written rather than on the technical errors in spelling and grammar. Among the specific identifying characteristics of students with creative writing ability they list are the following:

> The student with writing talent:
> 1. can develop a story from its beginning, through the build-up and climax, to an interesting conclusion.
> 2. gives a refreshing twist, even to old ideas.

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[4] Robert F. DeHaan and Jack Kough, Identifying Students With Special Needs. Teacher's Guidance Handbook, Secondary School Edition, Volume I. Chicago: Science Research Associates, 1956, Chapter 8.

3. uses only necessary details in telling a story.
4. keeps the ideas organized within his story.
5. chooses descriptive words that show perception.
6. includes important details that other youngsters miss, and still gets across the central ideas.
7. enjoys writing stories and poems.
8. makes the characters seem lifelike, captures the feelings of his characters in writing.[5]

Reading:

In order to document some common generalizations on the reading development of gifted children and to supply needed information on how children read, Strang made an analysis of the reading autobiographies of fifty-four seventh, eighth, and ninth grade pupils with I.Q.'s of 120 or over.[6] Her findings appear to support a number of generalizations which are commonly found in the literature. For example, she discovered that the children whose reading autobiographies she studied learned to read when they were five years old or younger. She also found that reading was an enjoyable and rewarding experience for these children and that they read from three to twenty hours a week. Furthermore, they had broad reading interests, enjoying the reading of the boys' and girls' series as well as children's classics and later selecting teen-age stories as well as adult fiction.

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[5] Ibid., pp. 41-42. For an interesting discussion of the use of films in stimulating creative expression and in identifying students with writing talent, see Paul Witty, "Who Are The Gifted?" Education for the Gifted. The Fifty-seventh Yearbook of the National Society for the Study of Education. Chicago: The University of Chicago Press, 1958, pp. 56-59.

[6] Ruth Strang, "Reading Development of Gifted Children," Elementary English, 31, 35-40 (January, 1954). For a carefully documented discussion of the reading preferences and activities of intellectually talented children, see Marian Scheifele, The Gifted Child in the Regular Classroom. Practical Suggestions for Teaching, No. 12. New York: Bureau of Publications, Teachers College, Columbia University, 1953, pp. 7-11.

A similar study was reported by Barbe.[7] One hundred and three freshmen and sophomore high-school students with I.Q.'s of 130 or higher were studied in order to secure a better understanding of their reading habits and interests. All students were asked to fill out a questionnaire and a personal interview was held with those students reporting unusual information, such as having learned to read at the age of three. Forty-seven percent of the girls and thirty-three percent of the boys had learned to read before entering school. The average age of learning to read has been reported to be about six and one half. More than three-fourths of the students said they enjoyed reading and only four students remembered having had any difficulty in learning to read. The average amount of time spent weekly by the group was six hours. Biographies ranked high in the reading interest of both boys and girls.

English:

Various attempts to set up criteria for identifying secondary school students with high ability in English have been made. The report of a recent national conference on the academically talented, for example, includes the report of the discussion group on "The Education of the Academically Talented Secondary School Pupil in English."[8] The participants in this group discussed a number of factors related to the identification of students talented in English. Among these were: reasoning power; creativity; imagination; academic aptitude; achievement in reading, writing, spelling, grammar, speaking and listening; work habits and industry; ability to work with peers; and, innate interests. They agreed, however, that knowledge about all of these facets does not always give enough information and that criteria for the selection of those talented in English must be kept flexible. It should perhaps be noted that English was defined by this group so as to involve not only the arts of reading, writing, speaking, and listening, and all their complex areas, but also an appreciation and understanding of literature, a knowledge of semantics and grammar and an awareness of the power of language.

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[7] Walter Barbe, "A Study of the Reading of Gifted High-School Students," Educational Administration and Supervision, 38, 148-154 (March, 1952).

[8] See "Education of the Academically Talented Secondary School Pupil in English," The Identification and Education of the Academically Talented Student in the American Secondary School. Washington: National Education Association, 1958, pp. 90-96, especially p. 90.

Foreign Language:

As was pointed out earlier, very few descriptions of the student with unusual ability in foreign language appear in the literature. Currently, the emphasis is on providing a program of modern foreign languages for the academically talented student.[9] Peters,[10] however, reports an interesting experiment with foreign language students which has some bearing on the identifying characteristics of the student with talent in foreign language. In an effort to predict success and failure of students in elementary courses in French, Spanish, and German, he administered the vocabulary and paragraph reading sections of the Pennsylvania State College Examination to 443 freshmen students who were enrolled in these courses at Pennsylvania State College. The vocabulary test in particular proved to be a valid differentiator between students who achieved success and students who failed in foreign language study. The paragraph reading test proved to be most efficient in predicting success and failure in German.

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[9] See, for example, "Education of the Academically Talented Secondary School Pupil in Modern Languages," The Identification and Education of the Academically Talented Student in the American Secondary School. Washington: National Education Association, 1958, pp. 103-109.

[10] Harold C. Peters, "The Prediction of Success and Failure in Elementary Foreign Language Courses," Journal of Applied Psychology, 37, 178-181, (June, 1953).

From the foregoing discussion it is possible to draw several generalizations. It appears more than likely that the student who is talented in the area of language is an excellent reader with broad rather than narrow reading interests. It is also quite probable that because of his reading activity, such a student possesses an above-average vocabulary and a high degree of word-mindedness, the latter being especially true of the student who has writing talent. Quite evident, too, is the talented student's obvious enjoyment of reading and perhaps of writing. An indication of the validity of this latter statement is in the greater amount of time devoted by the talented student to his reading or writing activities. Also, it seems likely that the student who is talented in language has learned to read before or during his first year of school.

SOCIAL SCIENCE

A survey of the literature in this field reveals that there have been very few, if any, attempts to deal with talent in the social sciences as something unique. The common assumption seems to be that high general ability--intellectual talent--usually manifests itself in a particular field of interest--in this case the social sciences. (Here the term social science has reference to the subject matter from the fields of history, geography, political science, economics, sociology, anthropology, and psychology, regardless of whether they are taught separately or on an integrated basis. At the high-school level these fields are commonly known as social studies.) For the most part, attention is focused on the development of social science programs for the intellectually talented.[1]

Indications of Social Science Talent

Relatively few suggestions for identifying high level ability in the social sciences appear in the literature. However, a number of suggestions for identifying the intellectually talented are directed toward the social studies teacher. Steinberg,[2] for example, lists and elaborates the special qualities of the superior students for whom he believes the social studies program is especially suited to develop executive leadership. Among these are the following: excellent memory; ability to find subtle relationships among facts and ideas which are remembered; an insatiable curiosity about facts and concepts; restless mental activity which can be tranquilized only by the acquisition of new facts and ideas; an impatience with any form of intellectual marking time; and, reasoning that is both analytic and synthetic.

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[1] See pp.59-69 for a discussion of indices of intellectual talent.

[2] Samuel Steinberg, "Civic Education of Superior Students," Social Education, 6, 76-77 (February, 1942).

In a much more recent article, Gross[3] describes talented students as "particularly original, versatile, and independent." However, he also notes that they have excellent memories and superior reasoning ability and that they are able to master basic knowledge in about half the time needed by average children. Hunt[4] stresses that the academically talented have greater capacity than have their fellow students--greater capacity for understanding, for developing skills and for some kinds of leadership. Since they can absorb vicarious experience more rapidly and effectively than most learners, they can perceive more in a given length of time than most other students can. They are also able to deal competently and effectively with ideas about society--political, economic, and social--with greater ease and satisfaction than their high school teachers ordinarily have expected them to do. This last, according to Hunt, has particular significance for the teacher of the social studies.

Bolton and Otto,[5] in a curriculum bulletin of the National Council for the Social Studies, take the position that academically talented children possess no characteristics different in kind from other children. The basic difference is in the degree to which the characteristic is present in the individual. As they elaborate some basic principles in teaching the academically talented, Bolton and Otto state or imply a number of characteristics of these individuals. Among the characteristics stated or implied are the following: Academically talented students are usually more mature emotionally than their age mates; thus they may find it easier to adapt to situations which they are unable to change, but they are often impatient and displeased with situations caused by the comparative immaturity of their classmates. Their superior intelligence frequently gives them insights that are helpful in solving problems. And, at the same time they may be aware of issues not ordinarily recognized by average children. The academically talented possess a lively curiosity. They are able to project themselves into the life of other times and places. They possess more information than their classmates on a great variety of social studies topics. At the same time they have a tendency to neglect routine school tasks which seem to lack intellectual challenge, often resulting in a comparatively low level of performance in handwriting, arithmetic, and the mechanics of oral and written expression. They usually enjoy reading and can assimilate ideas very quickly. They also show more independence than their age-mates in the use of community resources, often searching the community for authorities to aid them and their classes in solving problems in their fields of interest.

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[3] Richard E. Gross, "The Challenge of Social Education for the Gifted," The Social Studies, 45, 199-204 (October, 1954).

[4] Erling M. Hunt, "Secondary School Programs: Social Studies," Education for the Gifted. Fifty-seventh Yearbook of the National Society for the Study of Education, Part II. Chicago: University of Chicago Press, 1958, pp. 284-290.

[5] Merle R. Bolton and Henry J. Otto, "Basic Principles in Teaching the Academically Talented," The Social Education of the Academically Talented. Curriculum Series No. 10. Washington: National Council for the Social Studies, Chapter IV.

Some years ago, Skinner[6] focused attention on the individual whose talent manifests itself in civics. Her "snapshot of the bright pupil" in the civics class follows:

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[6] Mabel Skinner, "The Bright Pupil in the Civics Department of the Washington Irving High School," High Points, 16, 16-21 (October, 1934).

> She has intellectual superiority, manifested in our subject by an ability to see more clearly, interpret more rationally and decide more wisely in all matters affecting our community life. She has finer social and civic attitudes, and is more socially minded. She seems to have a greater capacity for emotional development, both in depth and in control. She seems to have a greater urge and zest for well-doing for the common good. Above all, she has a marked gift for leadership.[7]

As was pointed out earlier, specific suggestions for identifying individuals with unusual ability in the social sciences are seldom found in the literature. However, Oliver,[8] in a chapter in the curriculum bulletin referred to above, not only concerns himself with procedures for identifying the academically talented but also suggests criteria which might help the teacher locate those outstanding in social science competencies. In discussing the identification of the academically talented, Oliver emphasizes that considerable caution is necessary. The problem of identifying rapid learners, he points out, is complicated by the fact that there is often a considerable discrepancy between a student's potential and his performance, and that the former cannot be inferred from the latter. He suggests that the academically talented possess the following significant characteristics: a tendency to see relationships quickly; the ability to handle abstractions easily; a high level of verbalization; a tendency to be highly critical; and, a tendency to reflect upon the things they learn, to seek the "whys." They also tend to have good social relationships, to be independent in thought and action, to exhibit a strong and innate curiosity, to read extensively and deeply, and to engage in hobbies which require intellectual activity.

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[7] Ibid., p. 16.

[8] Albert I. Oliver, "Identifying the Academically Talented Pupil," The Social Education of the Academically Talented. Curriculum Series No. 10. Washington: National Council for the Social Studies, 1958, Chapter II.

Oliver then suggests that the teacher move from a consideration of such signs of high general ability to those indicating talent in the social sciences. These might be stated as criteria which would help locate those outstanding in social science competencies. Oliver proposes the following list:

> The superior student in the social sciences:
>
> 1. can handle time concepts--not only the historical relationships among men and events but also a sense of knowing that "now is the time...".
> 2. shows interest in biography and can speculate on the turn of events that might have been; for example, "If Hamilton had not been killed...".
> 3. possesses the ability and the willingness to evaluate important issues in human affairs; shows insight into the significance of events.
> 4. displays social sensitivity--is really interested in people, in the world, in social problems, and desires to do something about them; is able to "put self in the other person's shoes".
> 5. demonstrates the ability to propose or even to make rational choices among already proposed alternatives.
> 6. is open-minded--willing to listen to others, willing to be convinced.
> 7. shows intellectual curiosity about the social sciences.
> 8. is cautious about reaching conclusions, especially from insufficient data.
> 9. has ability to carry on research (facility in this can be brought out in the earlier grades); uses resources effectively.
> 10. possesses reading skill as shown in rate and in level of comprehension; learns to scan for the important and to bypass the unimportant.[9]

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[9] _Ibid_., p. 18.

There seems to be agreement that the student who manifests talent in the social sciences is generally of high intellectual ability with good memory and reasoning ability and with unusual insight and ability to perceive relationships. He is well developed emotionally, enjoying good social relations and often exhibiting leadership qualities. He enjoys reading, and utilizes this wide and deep reading as well as other resources of the community in trying to understand basic social issues and biographical figures. In these things he shows great independence and an unusual sense of social responsibility.

ART

A survey of pertinent literature reveals that relatively little has been written recently concerning fully developed artistic talent *per se*. However, considerable attention has been given to the identification of students potentially talented in art. And much has been written concerning creativity in the arts. In this discussion it is assumed that talent in art is synonymous with creativeness in art, and research studies on creativity are drawn upon quite heavily.

Much of the research in this area focuses on the personality of creative individuals. And, frequently these individuals are described in terms of rather specific identifying characteristics. In some cases, however, the characteristics of the creative work are the center of study. In still other instances the creative experience or process receives the major attention of the researcher. To complicate matters, not only are there these differences in approach to the study of creativity in the arts, but there are differences of opinion as well as to how much emphasis should be given to the development of creativity(talent) in terms of the quality of the product as contrasted with the possibilities for self-expression. As might be expected, those who attach considerable importance to productivity usually make a sharp distinction between the creative product and the creative experience. Stein,[1] for example, defines a creative work as a novel work that is accepted as tenable or useful or satisfying by a group in some point in time. A novel work, according to Stein, is one that did not exist previously in precisely the same form. "It arises from a _reintegration_ of already existing materials or knowledge, but when it is completed it contains elements that are new."[2] This latter point, Stein claims, constitutes a necessary distinction between the creative product and the creative experience.

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[1] See M. I. Stein, "Creativity and Culture," *Journal of Psychology*, 36, 311-322 (1953).

Indications of Artistic Talent

The Creative Artist

A number of studies of the creative artist are reported in the literature. For the most part, these are studies of the artist as a creative person, the central focus being on the personality characteristics of the artist. In some cases, however, there is an effort to describe the creative behavior of the artist. In any event, the attempt seems to be to clarify the nature of creativity in the arts and to find ways for promoting its development.

Several pilot studies have provided some valuable clues concerning the nature of creative behavior. Barkan and Hausman,[3] for example, in an effort to clarify hypotheses for research into creative behavior, conducted two pilot studies, one of which focused on college level art students while the other involved a group of twleve year old children participating in a related arts program. In studying the college students it was found that the three who had been identified by their instructors as creative had in common the capacity to control physical materials and to produce objects with a high degree of skill. One of the students suggested a model of a creative person. Unlike the other two students, who were reported as needing a relatively "fixed image" before they felt free to act, this student was able to entertain many alternatives as she acted before choosing an image which emerged through her work. The recorded behaviors of two of the twelve year old children served to confirm the authors' hypotheses that high level involvement is accompanied by behaviors which are more, rather than less, relevant to the central demands of the task, thus causing the authors to comment that identification with a task is a prerequisite for the creative giving of oneself. From these two studies Barkan and Hausman conclude that a creative person is sensitive to a broad range of possibilities, but that he is also aware of the necessity for decision making and action. He is able to tolerate the ambiguities and uncertainties in weighing alternatives, and is able to focus on an alternative he has selected for action.

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[2] _Ibid._, p. 311.

[3] Manuel Barkan and Jerome Hausman, _Two Pilot Studies With The Purpose of Clarifying Hypotheses For Research Into Creative Behavior_. (Reprint from Research in Art Education, NEA Seventh Yearbook.)

Drevdahl and Cattell[4] studied some of the differences and similarities of a small group of writers and artists as compared with the normal or "standardization" population. Using Cattell's personality test, the authors concluded that the experimental population differed from the normal population in being somewhat more intelligent, emotionally mature, dominant, adventurous, sensitive, bohemian, radical, self-sufficient, and of a high ergic tension level. They were also considered to be less cyclothymic (less prone to alternating periods of elation and sadness, activity and inactivity, excitement and depression), surgent, and subject to group standards and control. Artists were significantly higher in sophistication than the general population although they appeared to be more bohemian but less cyclothymic and intelligent than writers. The authors comment on the low correlation of intelligence and artistic ability and state that artistic talent and creativity are more dependent upon emotional experience than upon intelligence. Also noted by Drevdahl and Cattell is the consistency in the findings of their study and a similar one on creative scientists, thus indicating factors that may have some bearing on creativity in the abstract, apart from any particular field of application or mode of activity.

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[4] John E. Drevdahl and Raymond B. Cattell, "Personality and Creativity in Artists and Writers," Journal of Clinical Psychology, 14, 107-111 (April, 1958).

The preceding comment finds some support in the findings of Lowenfeld[5] who noted the similarity in the criteria for creativeness in the arts which he discovered and those which Guilford found in an independent study intended to find measurable criteria in the exact and applied sciences. Lowenfeld, in referring to some of the basic findings of research on creativity, lists and discusses the following eight attributes of creativity which significantly differentiate creative from less- or ~~more~~ non-creative persons:

1. Sensitivity to problems
2. Fluency of ideas
3. Flexibility (enables us to understand the individual's ability to adjust quickly to new situations)
4. Originality
5. Redefinition and the ability to rearrange
6. Analysis, or the ability to abstract
7. Synthesis and closure (the combining of several elements to form a new whole)
8. Coherence of organization (striving for higher forms of organization)[6]

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[5] Viktor Lowenfeld, "Current Research on Creativity," NEA Journal, 47, 538-540 (November, 1958).

[6] Ibid., pp. 539-540.

Somewhat earlier Meier[7] had listed six general factors basic to artistic ability. These factors identified as a result of ten years of research (including case studies and life histories) are as follows:

1. Manual skill
2. Energy output and perseveration (concentrated effort in art)
3. Intelligence
4. Perceptual facility for factors relevant to art activity
5. Creative imagination
6. Aesthetic judgment

Of these, aesthetic judgment is considered by Meier to be the most important. The first three of these he believes to be related most closely to stock inheritance (different from direct inheritance), while the last three are related most closely to the aesthetically significant environment. All of these, along with interest and drive on the part of the individual, are necessary for art talent. Without them, according to Meier, no person can be considered artistically talented, regardless of his interest and drive.

Stein,[8] after studying the personalities of a small group of Chicago artists, hypothesized that a creative person has a lower threshold, or greater sensitivity, for the gaps that exist in the environment. A creative person also has the capacity to tolerate ambiguity. He "is capable of existing amidst a state of affairs in which he does not comprehend all that is going on, but he continues to effect resolution despite the present lack of homeostasis."[9] Some individuals, Stein points out, do not go beyond this latter stage while some go on to hypothesis formation and hypothesis testing.

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[7] Norman C. Meier, "Factors in Artistic Aptitude: Final Summary of a Ten Year Study of a Special Ability," Psychological Monographs, 51, 140-158, No. 5, 1939.

[8] Stein, op.cit.

[9] Ibid., p. 312.

According to Greenacre,[10] some understanding of the basic characteristics of creative talent can be secured from the subjective accounts of creatively talented people writing of their own work and lives and from descriptions of the creative process by those gifted ones who were experiencing it. She maintains that it is possible to describe these basic characteristics under four headings: (1) greater sensitivity to sensory stimulations; (2) unusual capacity for awareness of relations between various stimuli; (3) predisposition to an empathy of wider range and deeper vibrations than usual; and (4) intactness of sufficient sensorimotor equipment to allow the building up of projective motor discharges for expressive functions. Greenacre, who uses the term "artist" to refer to those possessing unusual creative productivity in any field, further asserts that intellectual brightness is a help to greater productiveness and enhances creative imagination but is not a substitute for it. While convinced that genius is already laid down at birth, Greenacre emphasizes the importance of identification which largely determines the direction and development of talent.

Barron[11] found it difficult to reconcile his knowledge of the lives of a number of highly creative figures in history with the characteristics of a psychologically healthy human being as agreed upon by a number of psychoanalysts, psychiatrists, and psychologists. In working his way through this apparent conflict, he advanced the idea that the creative individual not only respects the irrational in himself but counts it as the most promising source of novelty in his own thought. Barron then proposed the following statements as descriptive of creative artists (and perhaps creative scientists):

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[10] Phyllis Greenacre, "The Childhood of the Artist," The Psychoanalytic Study of the Child, 12, 47-72 (1957).

[11] Frank Barron, "The Psychology of Imagination," Scientific American, 199, 150-166 (September, 1958).

> Creative people are especially observant, and they value accurate observation (telling themselves the truth) more than other people do.
>
> They often express part-truths, but this they do vividly; the part they express is the generally unrecognized; by displacement of accent and apparent disproportion in statement they seek to point to the usually unobserved.
>
> They see things as others do, but also as others do not.
>
> They are thus independent in their cognition, and they also value clearer cognition. They will suffer great personal pain to testify correctly.
>
> They are motivated to this value and to the exercise of this talent (independent, sharp observation) both for reasons of self-preservation and in the interest of human culture and its future.
>
> They are born with greater brain capacity; they have more ability to hold many ideas at once, and to compare more ideas with one another--hence to make a richer synthesis.
>
> In addition to unusual endowment in terms of cognitive ability, they are by constitution more vigorous and have available to them an exceptional fund of psychic and physical energy.
>
> Their universe is thus more complex, and in addition they usually lead more complex lives, seeking tension in the interest of the pleasure they obtain upon its discharge.

> They have more contact than most people do with the life of the unconscious--with fantasy, reverie, the world of imagination.
>
> They have exceptionally broad and flexible awareness of themselves. The self is strongest when it can regress (admit primitive fantasies, naive ideas, tabooed impulses into consciousness and behavior), and yet return to a high degree of rationality and self-criticism. The creative person is both more primitive and more cultured, more destructive and more constructive, crazier and saner, than the average person.[12]

At the risk of over-simplification the studies of the artist as a creative person may be summed up by saying that the creative artist has a receptive and open mind., i.e., while he has a greater sensitivity to problems he is also alert to a broader range of possibilities in solving them. Further, he is able to tolerate ambiguities and uncertainties, but is also capable of strong identification with his work. He is also said to have a greater fluency of ideas, the ability to analyze and synthesize, as well as being more original, more observant, and less subject to group standards. On the matter of intelligence, many writers state or infer that while the intelligence of the creative artist is above that of the normal population, it has a relatively low correlation with artistic talent or creativity.

The Artistically Talented Student

Some of the writers dealing with indication of art talent in students describe general characteristics of the student talented in art, whereas other writers deal with characteristics which are obviously related to art activity. One of the simplest descriptions is given by Winslow who states:

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[12] _Ibid._, p. 164.

> The superior child in art invariably likes to draw. He is usually of normal or higher intelligence, is highly imaginative, likes artificial things better than natural things, enjoys participating in constructive activities. He is also inventive and more responsive to educational stimulation than are most of his classmates.[13]

Gaitskell[14] suggests that children gifted in art may be recognized by their outstanding performance, for they consistently produce a relatively large amount of sensitive and original art work of a standard higher than that found in the output of their fellows. Also, these children usually have high I.Q.scores and are well adjusted both socially and emotionally, often displaying a well developed sense of humor. They are intensely interested in their work, and thus cause very few discipline problems. The boys often produce work of greater merit than the girls, but are also more easily discouraged; therefore, the girls tend to produce meritorious work more consistently. Honest criticism is welcomed by all, but they demand the greatest sincerity and honesty. They are most critical of their own work, in a harsh but penetrating way. They seem to prefer to work individually rather than in groups, yet they continually seek guidance. Children gifted in art, according to Gaitskell, are able to isolate and define problems which arise in their work and are quick to establish goals for expression and to find meanings, points of view, and visual relationships in their environment.

As contributors to The Gifted Child, a volume influential in awakening interest in the conservation and utilization of human resources, Lally and LaBrant[15] express a concern for recognition of children who are talented in art, or music, or writing, as well as those talented in more traditionally academic fields. They review studies which have dealt with the nature of art ability and the identification of talented art students, then discuss several characteristics of children who are talented in this area. Unusual aptitude in art, they point out, is often indicated by continued attention to a problem of drawing, painting or modeling, or by ability to make something unique (rather than copy) from the medium at hand. These children often have a persistent and sustained interest in art, expending an exorbitant amount of energy on their creative work, yet showing little fatigue. They seem to be quite sensitive to sensory stimuli; their drawings and paintings are both unique and rich in detail. Their unusual ability to collect and store sensory images is associated with a vigorous creative imagination. They tend to think in terms of visual images and to translate these images into originally designed arrangements.

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[13] Leon L. Winslow, "For the Child Superior in Art," The Baltimore Bulletin of Education, 31, 17 (June, 1954).

[14] Charles D. Gaitskell, "Art for Gifted Pupils," School Arts, 54, 9-12 (March, 1955).

Paul Witty also calls for increased attention to those students whose talent is evidenced in non-academic subjects as a means for making better use of our human resources. In a recent article[16] he gives special attention to identifying characteristics which might assist parents in the identification of children who evidence a general giftedness as well as those who are gifted in creative writing, art, and social leadership. In discussing "signs" of talent in drawing and painting, he suggests that the very young child be watched for:

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[15] Ann Lally and Lou LaBrant, "Experiences With Children Talented in the Arts," The Gifted Child (Edited by Paul Witty). Boston: D. C. Heath and Company, 1951, pp. 243-256.

[16] See Paul Witty, "Every Parent and Teacher a Talent Scout," National Parent-Teacher, 51, 4-6 (June, 1957).

1. Efforts to draw, in crayon or pencil, many things that he has seen.
2. Skill in drawing pictures of animals and people.
3. Appreciation of color in his drawings and his paintings.
4. Appreciation of design.
5. Originality in the use of finger paints, skill in combining colors in effective patterns.
6. Interest in pictures and picture books.
7. Reproduction of his own experiences in some art form.
8. Unusual success in painting, clay modeling, or soap carving.
9. Interest in other people's creative work - at exhibitions, in museums, in school and elsewhere.[17]

In their discussion of the identification of students with artistic talent, DeHaan and Kough[18] recognize that many subject-matter teachers may feel either uninterested or inadequate in identifying artistic talent. In submitting a list of characteristics to help identify students with artistic talent they note that not all of these characteristics will emerge in the daily routine of subject-matter work. They suggest, though, that the artistically talented student is one who:

1. Covers a variety of subjects in his drawings or paintings.
2. Takes art work seriously. Seems to find much satisfaction in it.
3. Shows originality in choice of subject, techniques, and composition.
4. Is willing to try out new materials and experiences.
5. Fills extra time with drawing, painting and sculpturing activities.
6. Uses art to express his own experiences and feelings.
7. Is interested in other people's art work. Can appreciate, criticize, and learn from others' work.
8. Likes to model with clay, carve, or work with other forms of three-dimensional art.[19]

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[17] _Ibid._, pp. 5-6.

[18] Robert F. DeHaan and Jack Kough, _Identifying Students With Special Needs_, Teacher's Guidance Handbook, _Secondary School Edition_, _Volume I_. Chicago: Science Research Associates, 1956, Chapter 7.

[19] _Ibid._, pp. 38-39.

What agreement is there among writers who consider indications of art talent in the student? In general, it seems agreed that the artistically talented student likes to draw, does a great deal of it (is almost persistent in this), and is usually skilled in this form of expression. But he does not restrict his activity to any one form of expression; rather, he enjoys working with various art-media. The artistically talented student is imaginative, and his work shows originality. He is interested in the art work of other people, enjoys it, and can criticize it. Ordinarily he is above average in general intelligence.

MUSIC

There appears to be some disagreement among authorities concerning the nature of musical ability or talent. It is rather generally agreed, however, that there are two kinds of musical aptitudes - those for reception and those for musical production. The first is frequently referred to as musicality and the second as talent. While the two are supplementary, one can be present to a much greater degree than the other. Musicality, however, is considered to be of first importance either in musical receptivity or in musical performance. Hence, the major attention of research workers has been largely centered on the attributes of the musically inclined personality.

Schoen,[1] in surveying the research on musical aptitudes, points out that various researchers approach musicality quite differently. Billroth,[2] for example, defines musicality as "the ability to retain and always recognize and reproduce a short, rhythmical, and definitely organized melody." This ability is possessed by most people, and the individual who is deficient in it is unmusical. Stumpf,[3] on the other hand, stipulates four criteria for musicality: "(1) to sing a given tone correctly, (2) to discriminate higher and lower tones, (3) to judge whether one or two tones are present in a clang, (4) to discriminate between degrees of consonance as to pleasantness."[4] Schoen contends that in a complex power such as musicality, it is to be expected that investigators will differ.

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[1] See Max Schoen, The Psychology of Music. New York: The Ronald Press Company, 1940, Chapter 8.

[2] Quoted by Schoen, Ibid., p. 152.

[3] Quoted by Schoen, Ibid., p. 152.

[4] Ibid.

However, he maintains that rather than involving contradiction, the thinking of the different investigators contributes to a more complete picture.

The results of other early research studies serve to clarify the nature of musicality. Hascher and Ziehen,[5] for example, identified five factors of musicality, namely, sensory, retentive, compositional, motor, and ideational. The sensory factor consists of sensitivity and discrimination of pitch, intensity, and duration. The retentive component includes memory for timbre, pitch intensity, duration, tonal successions, and tonal combinations. Feeling for the formal elements of music, melody, motif, and theme, constitutes the compositional factor. The motor factor refers to the power of vocal or instrumental reproduction of what is heard, and the ideational component is the richness of ideas of a non-tonal nature stimulated by tonal forms. These authors, however, insist that inability of vocal reproduction is no sign of lack of musicality.

The nature of musical talent is perhaps a more controversial question than that of musicality. Schoen asserts that talent is first an inborn capacity and that training can only develop that which already exists potentially. Therefore, musical capacity is to be distinguished from musical ability, the latter being acquired through training, practice or experience. Further, once the capacity is determined, it is possible to predict the degree of ability that a person will attain. Schoen also maintains that talent for music is not a single power or capacity but rather consists of several groups of talents. The practicing musician, therefore, exercises a cluster of powers which together produce a single effect. The specific talents making up the whole of musical talent he summarizes as "Musical Feeling, Musical Understanding, Musical Sensitivity, and Musical Virtuosity--forming the affective, the intellectual, the sensory, and the motor bases of musical artistry."[6]

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[5] Reported in Schoen, Ibid., pp. 155-157.

Shimp,[7] in reviewing the literature concerning musical ability notes that the concept of musical ability has developed into two schools of thought. One view is that musical ability can be predicted from samples of auditory ability to make discriminations in such things as pitch, loudness, time, and tone color, while the other view is that musical ability can be predicted only with reference to musical behavior. Seashore, the major advocate of the first view, has labeled it as the "multi-factor theory" and referred to the second as the "omnibus theory".

Characteristic of the latter theory, according to Shimp, is the clinical approach in which one's musical ability is determined through some aspect of musical behavior such as reproducing a relatively strange melody by singing or using an instrument. On the other hand, proponents of the multi-factor or integrative theory have assumed that musical ability is composed of the several auditory abilities such as pitch discrimination, time discrimination, loudness discrimination, and other factors such as memory for individual tones, memory for groups of tones, and musical imagery or the power to hear music subjectively. Also noted by Shimp is the increasing prevalence of the idea that music ability is merely general ability operating in the music fields. Interest and proficiency in music would, therefore, stem from early and successful musical experiences thus directing a person's energies toward this field.

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[6] Ibid., p. 162.

[7] See William Bennett Shimp, "The Prediction of Success in College Music," Abstracts of Doctoral Dissertations, No. 55, (Summer Quarter, 1947-48) The Ohio State University Press, 1949, pp. 251-258.

Pressey,[8] in focusing attention on precocious musicians and athletes also stresses the importance of early opportunities for ability to develop. In brief, he reports that a study of the careers of notable precocious musicians of the eighteenth century and of present day athletic champions, suggests that the following factors came into play early: a favorable immediate environment, especially the encouragement of family and friends; expert instruction; frequent and progressive opportunities for the exercise of the ability; close association with others in the field; and frequent success experiences. His thesis is that "in attempting to account for notable precocity in such fields as music and athletics, too much stress has been put on presumed extreme constitutional genius and too little on a concomitance of favorable factors, operating in the growth years."[9] He suggests that there may be ways by which more geniuses might not only be discovered but even to a substantial degree _made_ and brought to fruition.

Indications of Talent

One method for determining indications of musical talent is the examination of the lives of recognized musicians. Graham[10] reports such a study of the lives of twenty-three famous musical composers. All these composers had had a musical environment as children and had shown talent and started taking lessons at an early age. About half the group had practical experience in their youth, copying parts, playing for pay, or accompanying. Over half the group started improvising and writing down notes between the ages of five and fifteen. Most of them did well in school. As adults these composers had rich musical lives, fully devoted to music. They were all great improvisors. Their lives were full of a drive to say something, Graham reports, although at times they were not sure just what it was. They were aware that they needed improvement and help.

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[8] Sidney L. Pressey, "Concerning the Nature and Nurture of Genius," _The Scientific Monthly_, 81, 123-129 (September, 1955).

[9] _Ibid._, p. 124.

[10] John R. Graham, "Study of Composers Yields Helpful Facts About Musical Talent, " _Instrumentalist_, 9, 36+ (March, 1955).

Graham's findings are supported by the pronouncements of two famous orchestra conductors. Darati,[11] in discussing his views on qualities essential for success in music, emphasizes that the career musician must have an overwhelming compulsion to make music, in one way or another, according to his special ability in this wide general field. Mitropoulos[12] states that the conductor must have an inborn ability to communicate to others in a way that will cause them to respond to him. In addition, he must have acquired the knowledge and skill which one would expect of a leader in the field of music.

Other writers report studies in which standardized tests were used to learn more about students with musical ability. Cooley,[13] for example, studied the relation between certain mental and personality traits and ratings of musical abilities. His sample consisted of 180 undergraduate music students, and his data were drawn from intelligence, reading, personality and musical talent test scores, as well as from applied music grades and ratings by 51 members of the music faculty. He concluded that high intelligence and high reading ability tend to be associated with musicality. He also presented some evidence which suggested that the personality profile of the college music student differs from that of the unselected college student. However, there was no evidence which pointed to a correlation of personality traits with musicality or ratings of functional musical ability.

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[11] Antol Darati, "Musicians Have No Choice," National Parent-Teacher, 50, 4 (February, 1956).

[12] Dimitri Mitropoulos, "The Making of a Conductor," Etude, 72, 15+ (January, 1954).

[13] John Christopher Cooley, "A Study of the Relation Between Certain Mental and Personality Traits and Ratings of Musical Abilities," Unpublished doctoral dissertation, Michigan State College, 1952. Dissertation Abstracts, 13, 240-241, 1953.

After selecting groups of New Zealand secondary school students known to be conspicuously musical or conspicuously non-musical, Whittington[14] utilized Wing's battery of seven tests as well as tests of intelligence and of manual dexterity in an attempt to determine factors present in these tests which would best discriminate between these two groups, thus enabling him to devise a shorter battery of tests of musical ability. As a criterion for "conspicuously musical" he selected subjects who had proved themselves in the theory and practice of music by achieving honors or merit in examinations in these areas. The "conspicuously nonmusical" were chosen for their complete dislike of music and the lack of musicality in their parents and siblings. It was noted that all of the "conspicuously musical" students were active participants in their school musical organizations, and that most of them had musical activity in the home.

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[14] R. W. T. Whittington, "Assessment of Potential Musical Ability in Secondary School Children," *Journal of Educational Psychology*, 48, 1-10 (January, 1957).

Whittington reports that he found a significant, but not high, correlation between the scores of the intelligence test and the Wing music tests. No correlation was found between the music tests and the test of manual dexterity. By far the most important finding, though, was a factor of "musical experience" which seemed to account for the major differences in scores between the "conspicuously musical" and "conspicuously nonmusical" groups.

Schoen,[15] whose survey of research was referred to earlier, claims that there _is_ evidence that in intelligence the musically talented individual ranks above average. Specifically, the musically talented individual has a quick comprehension, a retentive memory, wide interests, power of concentration, ambition, alertness, originality, and conscientiousness. The implication, Schoen points out, is that the possession of musical ability above the average carries with it a high degree of general intelligence.

Several authors, in describing symptoms for the presence of musical ability, provide some specific clues for those concerned with the identification of talent in this area. Hascher and Ziehen,[16] for example, list the following symptoms:

> ...inclination to a great deal of singing in earliest infancy; early participation in singing; early correct reproduction and imitation of a sung melody; early correct reproduction of played melodies in correct intonation and staying on key till the end; early correct singing of a second voice; early ability to sustain a melody in part singing; early transposition of a melody; early ability to reproduce a heard melody upon an instrument; early ability to retain and play by memory pieces heard but once or seldom; early recognition of intervals or melodies; early invention

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[15] Schoen, _op.cit._, pp. 164-165.

[16] Reported in Schoen, _op.cit._, pp. 155-157.

> of melodies; early improvisation on the piano or any other instrument; early recognition of false intonation; early discrimination of tonal quality; early ability to keep correct time; early imitation of complex rhythms; early manifestation of musical preferences.[17]

In a more recent publication DeHaan and Kough[18] suggest that if a student's musical interest or performance has not been stimulated by the time he is about sixteen years old, it is not likely to improve much after that. They do, however, provide a list of characteristics designed to help the classroom teacher identify the student with musical talent. The list follows:

> The student with musical talent:
> 1. responds more than others to rhythm and melody.
> 2. sings well.
> 3. puts verve and vigor into his music.
> 4. buys records, goes ot of his way to listen to music.
> 5. enjoys harmonizing with others or singing in groups.
> 6. uses music to express his feelings and experiences.
> 7. makes up original tunes.
> 8. plays one or more musical instruments well.[19]

There seems to be general agreement, then, that individuals who are musically talented usually manifest their talent early in life, for example, by singing early and by correctly reproducing played melodies by singing or by instrument, and by early improvisation. In most cases these individuals have grown up in rich musical environments and have had many opportunities to develop their talent. They usually are active participants in musical organizations. The question of the relation of intelligence to musical talent is a controversial one, but there is considerable evidence which suggests that individuals who are musically talented are above average in intelligence. More specifically, talent in music seems to be evidenced by the following: inclination to participate in singing and/or playing; compulsion to make music; sensitivity to and discrimination of tonal quality; response to rhythm as well as melody; retention and reproduction of both sung and played melodies; composition of original melodies; improvisation on one or more instruments; outstanding production of music--vocally or instrumentally.

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[17] Ibid., pp. 156-157.

[18] Robert F. DeHaan and Jack Kough, Identifying Students With Special Needs, Teacher's Guidance Handbook, Secondary School Edition, Volume I, Science Research Associates, 1956, Section 10.

[19] Ibid., p. 47.

DRAMATICS

Dramatics occupies a relatively small place in the curriculum of most high schools. Neither is it viewed by most people as essential for survival. Therefore, it is perhaps not too surprising to find that there is very little attention given to the identification and development of talent in dramatics in the current literature.

Indications of talent in dramatics, as in some other fields, has been approached on two levels, namely, (1) that of the potential actor as he might be observed in the school situation and, (2) that of the mature actor who has achieved success in the theatre or in some other dramatic medium.

Indications of Dramatic Talent

An example of the first approach is found in DeHaan and Kough.[1] They stress that dramatic talent is an asset that should not be lost and that many subject-matter teachers can make some dramatic activity a part of regular classroom work. Following is the list of identifying characteristics they suggest:

The student with dramatic talent:

1. readily shifts into the role of another character.
2. shows interest in dramatic activities.
3. uses voice to reflect changes of idea and mood.
4. understands and portrays the conflict in a situation when given the opportunity to act out a dramatic event.
5. communicates feelings by means of facial expression, gestures, and bodily movements.
6. enjoys evoking emotional responses from listeners.
7. shows unusual ability to dramatize feelings and experiences.
8. moves a dramatic situation to a climax and brings it to a well-timed conclusion when telling a story.

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[1] Robert F. DeHaan and Jack Kough, Identifying Students With Special Needs, Teacher's Guidance Handbook, Secondary School Edition, Volume I. Chicago: Science Research Associates, 1956, Chapter 9.

9. gets a good deal of satisfaction and happiness from play-acting or dramatizing.
10. writes original plays or makes up plays from stories.
11. can imitate others. Mimics people and animals.[2]

In a book which turns to the testimony of the mature performer, Cole and Chinoy[3] have gathered statements, advice and opinions of actors and actresses regarding the art of acting from the time of ancient Greeks to living Americans. One eminent actor, David Belasco, in discussing acting as a science, emphasizes that the actor must possess extreme sensibility combined with quick and powerful intelligence. This, he feels, underlies "that strange natural faculty or gift whereby he is enabled to enter into, comprehend and interpret to others the experiences of successively, many persons, often most unlike himself; of seeming to be them, to know all their joys and sorrows, think their thoughts and veritably to live their lives."[4] To these attributes, and to long study, close thought, deliberate purpose and careful preparation, Belasco adds imagination. This enables the actor to portray roles and feelings which he actually is incapable of experiencing as he must retain complete self-control throughout his performance. The importance of imagination is stressed also by Laurette Taylor.[5] She believes that both magnetism and personality are important qualities (beauty is quite unnecessary) but imagination is far more important than either of these.

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[2] Ibid., pp. 44-45.

[3] Toby Cole and Helen Krich Chinoy (Editors), Actors on Acting. New York: Crown Publishers, 1949.

[4] David Belasco, "Acting as a Science," Ibid., p. 500.

[5] Laurette Taylor, "The Quality You Need Most," Ibid., pp. 517-520.

Thus we find in the literature, various attempts to describe the individual talented in dramatics. Several of these reflect the actor's ability to lose himself in the portrayal of another's role while yet retaining self-identity and self-control. This is termed "imagination" by the mature actors and seems to be considered by them to be the most important characteristics of the talented actor.

DANCE

A survey of the pertinent literature reveals that very little attention is given to the identification and development of talent in dance. Nor do very many secondary schools appear to be concerned with the development of a program in this area. In view of the current world situation and the emphasis on increased academic proficiency it is doubtful whether this situation will change in the near future.

The term "dance" encompasses a number of different forms, but talent in dance is usually discussed in connection with classical ballet and modern dance, rather than with folk, square or ballroom dancing. There seems to be some difference of opinion, however, particularly among those who work with modern dance, as to how much stress should be put upon the development of talent in terms of the quality or performance as contrasted with the therapeutic or self-expressive possibilities. Those who take the position that talent in ballet or modern dance is evidenced by outstanding performance have tended, for the most part, to describe the observable characteristics of professional female dancers. Few references are made to the talented male dancer.

Indications of Talent in Dance

As suggested above, very few descriptions of the high school student talented in dance appear in the literature. However, some indications of talent in this area may be inferred from various studies which compare dance students with other adolescents. Boroff,[1] for example, an English teacher in New York City's High School of Performing Arts compared his dance students with other adolescents in general and the other (music and drama) students in that school, in particular. Boroff reports that although there is a generally high level of intelligence among the dance students, as well as among the other students in this school (more than half of them go on to college), there seems to be no particular relationship between intelligence, in its academic setting, and either technical or interpretive ability in dance. In the setting of academic classes the dance students are rather typical adolescents, having the same problems as other students; and their range of interests is wide at this time.

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[1] David Boroff, "Are Dance Students Different?" Dance Magazine, 30, 28-29+, (October, 1956).

Boroff does note, however, that in some ways the dance students differ from the others. In appearance they are characterized by their carriage, the precision and discipline about their movements, and their tendency for neat and simple dress. They are more reliable than many other students, fulfilling formal requirements more scrupulously with great respect for detail (noted in margins and headings in English class). Emotionally they remain on a more even level than most other students at this school (performers are often noted for moodiness and volatile tempers). The dance student is described by Boroff as "body-oriented", quite likely to under-estimate her personality and intellectual resources. For this reason, he contends, very little of the school leadership is drawn from among the dance students.

In describing successful professional dancers, Boroff[2] paints a word picture of intelligent individuals coming from well-educated, well-to-do families. (Their intensive training is expensive.) They have great zest, and a wide range of strong cultural interests. In Europe, for example, they spend much time in museums. Most important though, he points out, is their love for and dedication to the dance.

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[2] David Boroff, "Group Portrait of a Ballet Dancer," Dance Magazine, 31, 28-31 (May, 1957).

Agnes DeMille[3] describes dancers as usually being smaller and more tautly knit than other people. Their chief and most appealing characteristic is a slenderness and a posture with a soldierly spine and sense of supple readiness which not even great athletes acquire. They walk from the hips like Indians--modern dancers stride with what amounts to a lope or a spring while ballet dancers walk splayed out and flat-footed, almost a shuffle. Dancers' faces are quiet and intelligent. They are quiet mainly because all their training has been by imitation and rote and in group work, and silence is rewarding under these conditions. Writing elsewhere about female dancers, DeMille[4] suggests that very few develop the bodies of mature women; they remain flat-breasted and lean in the hips. The greatest dancers, women most capable of communicating sensuous satisfaction, are actually in their bodies least sensual. This tendency of many dancers to never "grow up" or mature sexually DeMille relates to the historical role of women in society, womanhood inferring a loss of freedom through submission to male domination and motherhood.

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[3] Agnes DeMille, "About Dancers," Dance Magazine, 32, 32 (October, 1958).

[4] Agnes DeMille, "Artist or Wife," The Atlantic, 202, 52-58 (September, 1958).

In a behavioristic approach to the qualities necessary in a good dancer, Lawton[5] emphasizes the role of body chemistry and the responses of various parts of the nervous system. He states, "All the will in the world cannot make a good dancer. Nor will all the hope and prayer. Only having the right kind of body, plus the right training and enough time and hard work will do it."[6]

Most writers dealing with the basic qualities found in talented dancers, however, seem to take a different viewpoint. Terry,[7] for example, emphasizes that great physical prowess and elaborate technical equipment are not sufficient to make a great performer. The physically skillful student is content to "execute" his assignment, but the great performer "dances" every stillness and every movement. Ten prominent dancers interviewed by Terry agreed that sound craftsmanship is essential to successful performance, but insisted that it is only the departure point. The group split on answering whether this talent of the great performer is an innate gift or an acquirable quality, Terry himself believing it to be an innate gift. One other point upon which they all agreed, however, was that the dancer must have a great faith, a strong belief in what he is doing.

Mason[8] describes the present-day ballerina as being musical in the sense of being able to modify and interpret a dance phrase to music in much the same way as great musicians perform scores. She is, he says, a dance actress, able to dance many different kinds of roles and, like the great actress, is at the same time both herself and the role she is portraying. Mason stresses that outstanding technique is a principal characteristic of her work before she is recognized as a ballerina, but that there is something more. He states:

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[5] Shailer Upton Lawton, "The Miracle of Dance: A Neuro-Physical Study," Dance Magazine, 29, 24-25+ (November, 1955).

[6] Ibid., p. 84.

[7] Walter Terry, "The Art of Performing: An Act of Faith," Dance Magazine, 27, 10-11+ (August, 1953).

[8] Francis Mason, "What is a Ballerina?" Dance Magazine, 27, 14-16 (November, 1953).

> What ballerinas are born with is usually called talent. But deeper than this, I think, a great dancer's native gift is presence--a natural gift of presenting herself with both innocence and pride so that she will interest anyone who watches her. She knows how to walk and stand still; she does not have to dance to interest us immediately.[9]

What sort of agreement does one find in the literature regarding the characteristics of the individuals talented in dance? Probably two things stand out most prominently: (1) They have a great dedication to the art of dancing, and, (2) Although they are masters of dancing technique, they possess something more--an aesthetic quality enabling them to render effective interpretations. There is some disagreement, but most writers seem to believe that this is a basically innate quality. Another point on which there seems to be general agreement is that their carriage--their posture, movements and even stillnesses are characterized by a gracefulness and poise which sets them somewhat apart from others.

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[9] Ibid., p. 16.

MECHANICAL ARTS

A survey of the literature reveals that very little attention has been given in recent years to the identification of individuals with mechanical skills. The reasons for this are not altogether apparent, but the current focus on the academically talented may well have some bearing on the situation. There are, of course, a number of tests which purport to measure mechanical ability. And, a number of studies dealing with their validity or predictive value are reported in the literature. Rarely, however, are discussions concerning the nature of mechanical ability or descriptions of the characteristics of the mechanically able individual in evidence.

Indications of Mechanical Ability

Studies dealing primarily with the predictive value of tests of mechanical ability rather frequently give some attention to the nature of this ability. Patterson,[1] for example, in reviewing relevant research, suggests that in general various trades seem to require the same sort of abilities. The possible exceptions to this generalization are those trades which are electrical in nature. These seem to require a greater degree of mathematical ability and general intelligence. He notes that several factors appear to be basic to mechanical ability: spatial ability, perception, and mechanical information or experience. Verbal and numerical factors seem to be of considerable importance also.

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[1] See C. H. Patterson, "Predicting Success in Trade and Vocational School Courses: Review of the Literature," Educational and Psychological Measurement, 16, 352-400 (Autumn, 1956).

Patterson also generalizes that manual dexterity is not as important for success in a skilled trade as ability to acquire technical knowledge, ability to know when or where to apply it, and ability to understand and plan a process or job.

DeHaan and Kough[2] suggest specific procedures intended to help teachers identify students with unusual skills and abilities. In discussing the identification of students with mechanical skills they emphasize the increased need for expert craftsmen and the promising employment opportunities for technicians. All of these workers--aircraft mechanics, electronic technicians, metal workers, automobile mechanics, as well as those who produce or repair various gadgets and devices--need mechanical ability. Among the identifying characteristics of students with mechanical skills they list the following:

> The student with mechanical skills:
> 1. does good work on craft projects.
> 2. is interested in mechanical gadgets and machines.
> 3. has a hobby involving mechanical devices such as radios, model trains, construction sets.
> 4. can repair gadgets, can put together mechanical things.
> 5. comprehends mechanical problems, puzzles, and trick questions.
> 6. likes to draw plans and make sketches of mechanical objects.
> 7. reads Popular Mechanics or other magazines or books on mechanical subjects.[3]

Whether or not general intellectual ability underlies mechanical ability remains an unanswered question, but the rather limited amount of literature surveyed here seems to indicate that a general intellectual factor is involved. Spatial ability and perception are probably the most commonly agreed upon factors in mechanical ability. However, there is some evidence which suggests that verbal facility and numerical ability are factors also.

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[2] Robert F. DeHaan and Jack Kough, Identifying Students With Special Needs. Teacher's Guidance Handbook, Secondary School Edition, Volume I. Science Research Associates, 1956, Chapter 11.

[3] Ibid., pp. 49-50.

ATHLETICS

The present effort to locate literature with a direct bearing on indications of athletic talent met with comparatively little success. Few references to athletically talented or potentially talented high school students could be found. Most of the materials which seemed pertinent were concerned with the athletic prowess and/or interests of adults.

Relatively little attention has been given to the nature of athletic talent. Schrupp,[1] however, in noting the dearth of research in this area, points out that the studies which have been made seem to indicate that athletic ability involves more than just motor ability. Although it is difficult to isolate the other factors involved, what evidence there is, according to Schrupp, indicates the presence of such qualities as perseverance, ambition, and courage. He also reports that the components in athletic ability seem to be specific for different individuals and for different activities.

Pressey's[2] work on the nature and nurture of genius has some relevance here also. In attempting to account for precocious marked superiority, he made a study of precocious musicians of a century ago and of present-day athletes. He reports that a study of their careers suggests that the following factors are important in their development: a favorable immediate environment; superior guidance and instruction; frequent and continuing opportunities to practice and extend the ability; close association with others in the field; and, frequent success experiences. Thus, according to Pressey, the precocious genius exhibits especially clearly both the innate capacities and the developmental influences involved in extra-ordinary accomplishment. His thesis is:

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[1] Manfred H. Schrupp, "The Differential Effects of the Development of Athletic Ability of a High Order," The Research Quarterly, 24, 218-222 (May, 1953).

[2] Sidney L. Pressey, "Concerning the Nature and Nurture of Genius," The Scientific Monthly, 8, 123-129 (September, 1955).

> ...in attempting to account for notable precocity in such fields as music and athletics, too much stress has been put on presumed extreme constitutional genius and too little on a concomitance of favorable factors, operating in the growth years. Instances of great athletic skill emerging from efforts to overcome a seemingly crippling handicap seem to emphasize the potency of these last factors. Presumably, the original physical potentials of these individuals were good, although not manifest, before the handicap struck; but the great potential of favoring circumstances seems especially evident. In this connection Wechsler's argument may well be recalled--that the range of human physical traits, as in height, strength, and quickness, is really not great, and that the range in mental capacities may be less extreme than is usually supposed. Rather, *superior original capacity, growing under a favorable concomitance of circumstances, develops into genius.*[3]

This seems to suggest that there may be ways by which "many more 'geniuses' might be not only discovered but even, to a substantial degree, *made* and brought to fruition."[4]

Indications of Athletic Talent

Comparative studies frequently provide clues as to the characteristics of the talented. For example, Schrupp's[5] study of two groups of college graduates gives a picture of the athletically talented adult. In this study the experimental group consisted of men who had earned athletic letters while attending the University of Minnesota. The control group consisted of men who had been enrolled in the same college as the first group and who had graduated the same year but who had not earned letters. The letter men were found to be differentiated from the non-letter men by their continued interest in athletic activities, their tendency to be more conservative, as well as their attainments vocationally and in the armed services. These findings, according to Schrupp, may serve to throw suspicion on certain popular conceptions about college athletes; for example, that they never amount to much in adult life and that they fail to carry over into adult life their interest in athletics.

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[3] *Ibid*., pp. 124-125.

[4] *Ibid*., p. 125.

[5] Schrupp, *Ibid*.

Highmore[6] utilized factorial analysis in his study of athletic prowess. While his central concern was a comparison of two techniques, certain of his findings are pertinent here. It should be noted, however, that he limited his study to the physical nature of athletic ability. Nine situational tests which were thought to correspond to the physical movements actually employed in athletics were given to the 240 male subjects (average age, thirty), and they were rated on a five-point scale supplied by two physical education experts. The findings revealed a general factor with three group factors. The first, second, and third factor in the statistical approach where the general factor was most in evidence might be identified as elements connected with running, throwing, and jumping respectively. Among the other findings were that intelligence does not correlate with athletic ability and that a sense of musical rhythm, as determined by the Wing Rhythm Test, does not correlate with athletic rhythm.

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[6] George Highmore, "A Factorial Analysis of Athletic Ability," The Research Quarterly, 27, 1-11 (March, 1956).

In commenting on related research, Highmore refers to the work of Burt[7] and his co-workers who found a well marked general factor, closely correlated with general physical health, and special factors related to strength, quickness, dexterity, steadiness, and (later) endurance. A more recent work on physical appraisal, however, describes motor fitness as a limited phase of motor ability that emphasizes endurance, power, strength, agility, flexibility, and balance.[8]

DeHaan and Kough[9] suggest specific procedures to help high school teachers identify students with physical skills. The list of identifying characteristics which they suggest follows:

> The student with physical skills:
> 1. Is energetic and seems to need considerable exercise to stay happy.
> 2. Enjoys participating in highly competitive physical games.
> 3. Is consistently outstanding in many kinds of competitive games.
> 4. Is one of the fastest runners in the class.
> 5. Is one of the best coordinated, physically, in the class.
> 6. Like outdoor sports, hiking, and camping.
> 7. Is willing to spend much time practicing physical activities such as shooting baskets, playing tennis or baseball, or swimming.[10]

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[7] See Sir C. L. Burt, Tests and Assessments of Physical Capacities. London: London County Council, 1925.

[8] See Thomas Kirk Cureton and others, Physical Fitness Appraisal and Guidance, St. Louis: The C. V. Mosley Company, 1947, Chapter 1.

[9] Robert F. DeHaan and Jack Kough, Identifying Students With Special Needs, Secondary School Edition, Volume I. Chicago: Science Research Associates, 1956, Chapter 12.

[10] Ibid., p. 52.

It is difficult to generalize from the above data. The question concerning the relation of athletic ability and general intelligence remains unanswered, though at least one study suggests that there is little or no correlation between them. The same study suggests that a sense of musical rhythm has no correlation with athletic rhythm. It seems rather generally agreed, however, that the individual with athletic talent is apt to exhibit an above average muscular development, physical coordination, a high degree of energy, and outstanding performance in many kinds of physical activities. These characteristics are also likely to be combined with such qualities as perseverance, ambition, and courage. Consistent with these characteristics is the physically talented individual's strong interest in physical activities which is manifest in the large amount of time spent participating in games, practicing his skills, and engaging in various forms of physical exercise.

LEADERSHIP

Unlike those areas of human activity that have just recently become the subject of intensive investigation, questions concerning the nature of leadership intrigued researchers even before the current emphasis on the identification and development of talent. In his introduction to a discussion of leadership, Gibb[1] writes that the last decade, in social psychology and sociology, has witnessed a great concentration upon the scientific analysis of human behavior.

While reviewing the literature on this subject, one notes immediately that descriptions of leadership are closely related to the context of the group and of its goals and values. Consequently, some attention is given in many works to the definition of a group as well as to leadership in the group. The functional group is referred to by Gibb[2] as two or more organisms interacting, in the pursuit of a common goal, in such a way that the existence of many is utilized for the satisfaction of some needs of each. Some common goals, which must be such as to give satisfaction to the needs of individuals who participate in the group, are a necessary condition for the existence of a functional group. Leadership, Gibb contends, is probably best conceived as a group quality, as a set of functions which must be carried out by the group. If there are leadership functions which must be performed in any group, and if these functions may be "focused" or "distributed" then leaders will be identifiable both in terms of the frequency and in terms of the multiplicity or patterns of functions performed.[3]

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[1] Cecile A. Gibb, "Leadership," *Handbook of Social Psychology*. Volume II. (Edited by Gardner Lindzey). Cambridge, Mass.: Addison-Wesley Publishing Co., Inc., 1954, p. 877.

[2] *Ibid.*, p. 879. For more on groups and group leadership, see Raymond B. Cattell, "New Concepts for Measuring Leadership in Terms of Group Syntality," Chapter 2, pp. 16-28, and Ralph M. Stogdill, "Leadership, Membership, and Organization," *Group Dynamics Research and Theory*. (Edited by Dorium Cartwright and Alvin Zander). Evanston, Illinois: Row, Peterson and Co., 1953, Chapter 4.

Lippitt[4] suggests that the functional leadership approach is just one approach to the study of leadership. Other approaches, he outlines, include: the trait approach, a comparison of the physical, intellectual, or personality traits of leaders and followers; the situational approach, based on the hypothesis that a leader's behavior may vary from one setting to another; the behavior approach, an analysis of the kinds of functions which people carry out when they are in positions of leadership; and, styles of leadership approach, an investigation of the group climate created by different styles of leadership, i.e., democratic, laissez-faire, and autocratic. He does point out, however, that the group functions approach incorporates the other approaches outlined except for the trait concept. There seems to be little disagreement with this classification of approaches to the study of talent but there does seem to be some difference of opinion as to which approach is most fruitful. The trait approach currently is under fire. Lippitt, for example, reports that only 5% of the traits in over 106 such studies appeared in four or more studies.[5] Such disappointing results, he claims, hardly justify its continued use in the study of leadership.

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[3] Gibb, *Ibid*., p. 884.

[4] G. L. Lippitt, "What Do We Know About Leadership?," *Journal of the National Education Association*, 44, 556-557 (December, 1955).

[5] *Ibid*., p. 556.

And Shartle,[6] in describing the Ohio State Leadership Studies, states that the trait approach had reached an impasse even before the beginning of World War II. A promising approach to the study of leadership, he points out, is that of measuring and examining performance or behavior rather than traits. However, in the studies discussed here in relation to indications of leadership talent, the trait approach as well as the other approaches outlined above is in evidence.

Indications of Leadership Talent

Descriptions of leader behavior and reports of research studies in this area appear quite frequently in the literature. For specific suggestions to assist classroom teachers in identifying students with leadership ability the work of DeHaan and Kough is worthy of note.[7] The identifying characteristics listed by these authors are as follows:

> The student with leadership ability:
> 1. is liked and respected by most of the members of the class.
> 2. is able to influence others to work toward desirable goals.
> 3. is able to influence others to work toward undesirable goals.
> 4. can take charge of the group.
> 5. can judge the abilities of other students and find a place for them in the group's activities.
> 6. is able to figure out what is wrong with an activity and show others how to do it better.
> 7. is often asked for ideas and suggestions.

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[6] See Leader Behavior: Its Description and Measurement. (Edited by Ralph M. Stogdill and Alvin E. Coons). Columbus: The Bureau of Business Research, The Ohio State University, 1957, Section 1; and, Carroll L. Shartle, Executive Performance and Leadership. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1956. Halpin also urges that leadership be studied in terms of behavior and situations rather than traits. See A. W. Halpin, "Behavior of Leaders," Educational Leadership, 14, 172-176+ (December, 1956).

[7] Robert F. DeHaan and Jack Kough, Identifying Students With Special Needs. Secondary School Edition, Volume I. Chicago: Science Research Associates, 1956, Chapter 5. Also see Paul Witty, "Who Are The Gifted?" Education For The Gifted. Fifty-seventh Yearbook of the National Society for the Study of Education, Part II. Chicago: University of Chicago Press, 1958, p. 60; and A. R. Mead, "Who Are The Gifted?" Education, 79, 3-7 (September, 1958).

8. is looked to by others when something must be decided.
9. seems to sense what others want, and helps them to accomplish it.
10. is a leader in several kinds of activities.
11. enters into activities with contagious enthusiasm.
12. is elected to offices.[8]

Similar criteria for selecting outstanding leaders were used in an investigation of leader- non-leader differences in self and social adjustment at the intermediate and upper grade levels carried on at the Florida State University Demonstration School.[9] In this study, outstanding leaders and non-leaders of both sexes selected by teachers from grades one through twelve were given the California Test of Personality. Leader-non-leader differences were then analyzed with respect to the social and self-adjustment scales. The analysis yielded significant differences favoring the leader in freedom from withdrawal tendencies, freedom from nervous symptoms, school relations, and family relations. Following are the criteria used in the selection:

> _The leaders_ engage actively in directing the activities of the class or peer group, hold a position of prestige in class awarded by peers, have a definite influence on class and other group decisions, have opinions which are sought and respected by peers, are capable organizers with the ability to make decisions, participate actively in class activities, and encourage others to participate.
>
> _The non-leaders_ avoid any situation involving leadership or the direction of peers, are awarded little esteem or prestige by peers, seldom, if ever, give opinions or make decisions, make comments or offer ideas only when solicited by teachers or peers, are rarely asked for opinions by classmates, function only as followers, are ineffective as organizers, participate only passively, if at all, in class activities, and

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[8] DeHaan and Kough, _Ibid_., p. 33.

[9] See G. Terrell, Jr., and J. Schreffler, "Developmental Study of Leadership," _Journal of Educational Research_, 52, 69-72 (October, 1958). A study of the home conditions of high school leaders and non-leaders is reported by J. A. Barr and K. H. Hoover, "Home Conditions and Influences Associated with the Development of High School Leaders," _Educational Administration and Supervision_, 43, 271-279 (May, 1957).

have no influence over others in group activities.[10]

In another recent study of student leadership, Bratton[11] attempted to find out whether student officers have a monopoly of qualities and techniques of leadership and to determine the degree of their popularity. The results of a questionnaire and discussions with 238 students in core classes at P. K. Yonge Laboratory School of the University of Florida indicated that students do not select their officers solely on the basis of popularity and that elected officers do not have significantly more or fewer close friends than non-officers. Elective officers as a group, however, did tend to rank higher than non-leaders as a group.

Some investigators of student leadership have studied what might be called face-to-face leaders rather than holders of leadership positions. Marks,[12] for example, reports a study in which, from the naturally occurring informal social groupings among students, the persons who were seen as leaders or as influential by other group members could be distinguished from the followers. In this study, almost the entire population of a community high school, 715 students, were involved. Twenty-one boys' cliques and 28 girls' cliques were delineated; and a leader and a follower, selected from each on the basis of scores on a sociometric test. In addition to the sociometric "School Friend Questionnaire" the students were given a "Student Interest Questionnaire." A comparison of the leaders with followers within the cliques showed girl leaders significantly higher in science interests, athletic leadership, attractiveness, popularity prestige, prominence, and style setting, while the boy leaders showed significantly higher social interests than their clique followers and rated higher in acceptability, athletic leadership, popularity and prominence. Leaders in general seemed tobe much more sensitively distinguished from followers by the social responses of others to them than by their sociometric or interest test behavior. Marks suggests that there are important sex differences in styles of leadership in this sample with the boy leader showing "good guy" qualities which distinguished him from his followers while the girl leaders showed "big wheel" characteristics which distinguished her from her followers. Leaders, according to Marks, do not follow the norms of the group to the extent of being conformists and may actually be more defiant in their interest behavior than are followers.

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[10] Ibid., p. 69.

[11] See Patrick J. Bratton and others, "Status and Student Leadership in the Secondary School," Educational Leadership, 13, 209-214 (January, 1956).

[12] See J. B. Marks, "Interests and Leadership Among Adolescents," Journal of Psychology, 91, 163-172 (December, 1957).

Cattell,[13] in reporting a study of adult leadership, not only compares leaders with followers but also compares two kinds of leaders recognized in his study of one hundred groups of ten men each. The two kinds of leaders were the _popular_, _elected_ _leaders_ and the _effective_ _leaders_, who contribute most to the group goals. Cattell contends that those who become leaders in either sense have certain things in common. Compared with nonleaders they are significantly more intelligent, enthusiastic, conscientious, and bold, less given to feelingsof insecurity, stronger in will control, and less subject to anxiety or tension. In further comparisons, it is pointed out that effective leaders are significantly more intelligent than elected leaders and that they tend to show in greater degree the leader's freedom from neurotic anxiety, his strength of will, and his independent boldness. The elected leaders, on the other hand, are significantly more talkative and sociable. They show more impulsive emotionality and happy-go-lucky serenity in worrying circumstances. They are in general less readily inhibited and have had a less punishing life experience than individuals in the "effective leader" classification.

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[13] Raymond B. Cattell, "The Leader You Elected," _Adult Leadership_, 5, 54-56 (June, 1956). See also R. B. Cattell and G. F. Stice, "Four Formulae of Selecting Leaders on the Basis of Personality," _Human Relations_, 7, 493-507 (November, 1954).

This same division of the qualities of personality and intellect is utilized in a report of the work of Robert F. Bales[14] of The Harvard Laboratory. Bales describes leadership as a role that is often divided among at least two different types of specialists: the "task" specialist who focuses on the task-problems of the group, contributes the most ideas, and keeps the group working towards its official goals and the "socioemotional" specialist who works toward maintaining unity and good relationships among members. In an experiment involving twenty-four male undergraduates at Harvard, Bales' tentative findings indicate that the man who is judged by the group members to have the "best ideas" is not generally the "best liked" and that this separation tends to become more marked as time goes on.

Leader behavior has been the subject of intensive research at The Ohio State University for some years. As was mentioned earlier, in the Ohio State Leadership Studies, the approach was that of examining and measuring performance or behavior rather than traits. One phase which is particularly relevant here involved the development of a research tool for describing leader behavior and its use in a variety of organizational settings.[15] Here, leader behavior was approached in terms of how a leader goes about what he does rather than what he does while he operates as a leader. (Leadership is defined as the behavior of an individual when he is directing the activities of a group toward a shared goal.) Individuals representing various of the disciplines were members of the research staff which developed a leader behavior description questionnaire.[16] The questionnaire was administered to 206 persons who described leaders of groups in which they were members, and to 153 persons who described their own behavior as a leader of a group. Analysis of their responses showed that there were perhaps three dimensions of leader behavior:

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[14] See Morton Lieberman and Dorothy Stock, "The Two Tasks of Leadership," Adult Leadership, 5, 49-52 (June, 1956). For a more detailed account of the research described by Lieberman and Stock see R. F. Bales, "How People Interact in Conferences," Scientific American, 192, 31-35 (March, 1955); R.F. Bales and P. E. Slater, "Role Differentiation in Small Decision Making Groups," Family Socialization and Interaction Process (Edited by G. T. Parsons and R. F. Bales). Glencoe, Illinois: Free Press, 1955, pp. 295-306.

> Factor I. Maintenance of Membership Character.
> This factor represents behavior of a leader which permits him to be considered a "good fellow" by his subordinates. It reflects behavior which is socially agreeable to group members.
>
> Factor II. Objective Attainment Behavior.
> This factor has to do with the output of the group. It is a drive for objective or goal attainment.
>
> Factor III. Group Interaction Facilitation Behavior.
> This factor stresses the mechanics of effective interaction of group members. It represents the behavior of a leader which enables group members to recognize their functions in the group, and to know what is going on.[17]

An interpretation of the factor analysis by Hemphill and Coons suggests that the question of "how" leaders do their jobs might be answered in three ways:

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[15] See Leader Behavior: Its Description and Measurement, op.cit. The various phases of the studies are dealt with in nine monographs in the Leadership Series in the Ohio Studies in Personnel.

[16] For a report on the development of the Leader Behavior Description Questionnaire see Hemphill and Coons, Ibid., Section II.

[17] See Ibid., especially pp. 24-27.

1. A leader may stress being a socially acceptable individual in his interactions with other group members.
2. A leader may stress "getting the job done." This would involve emphasis upon group production and concern with problems relative to obtaining the group's objectives.
3. A leader may stress making it possible for members of a group or organization to work together. Emphasis would be on the leader's job as one of a "group catalyst."[18]

These three major "hows" of leader behavior, they point out, are not mutually exclusive. A given leader may utilize all of them to the same degree or he may use one at the expense of others.

Behavior serving only the individual goal attainment is not included in the definition of leadership in the Ohio State Studies. However, a number of investigations, according to Carter,[19] support a factorial structure which involves an individual prominence and achievement dimension (behaviors of the individual related to his efforts to stand out from others and individually achieve personal goals) as well as group attainment and sociability dimensions.

The relationship between individual traits and leadership behavior is a question of continuing interest to researchers in this field.[20] Much of the concern involves the relationship of intelligence to leadership. Many authors refer to an earlier work by Hollingworth[21] in which she notes that to be a leader of his contemporaries, a child must be more intelligent, but not too much more intelligent, than those that are to be led. Generally speaking, Hollingworth points out, a leadership pattern will not form, or will break up, when a discrepancy of more than about 30 points of I. Q. comes to exist between the leader and the led.

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[18] Ibid., p. 37.

[19] See Lamar F. Carter, "Evaluating the Performance of Individuals as Members of Small Groups," Personnel Psychology, 7, 479-480 (Winter, 1954).

[20] For a comprehensive survey of studies in which there was some attempt to determine the traits and characteristics of leaders, see R. M. Stogdill, "Personal Factors Associated with Leadership, A Survey of the Literature," Journal of Psychology, 25, 37-71 (1948).

[21] Leta S. Hollingworth, "What We Know About the Early Selection and Training of Leaders," Teachers College Record, 40, 575-592 (April, 1939).

Drawing on an impressive number of sources, Gibb maintains that with few exceptions, investigators agree that leaders are superior to non-leaders in general intelligence but that in many groups pursuing routine, mechanical, practical activities, intelligence is not highly valued.[22] In a review of the various findings, Gibb writes that there are indications that certain traits, such as intelligence, surgency,[23] dominance, self-confidence and social participation are frequently found to characterize leaders of various types in various situations. But in every case, he continues, the relation of the trait is more meaningful if consideration is given to the detailed nature of the role. A person does not become a leader by virtue of his possession of any one particular pattern of personality traits but the patterns of personal characteristics of the leader must bear some relevant relationship to the present characteristics, activities, and goals of the group of which he is a leader.[24]

DeHaan[25] also stresses that there is no consistent pattern of personal traits with which to characterize all leaders everywhere. Nor are there factors (related to individual traits) which differentiate leaders from non-leaders. In elaborating his position, DeHaan states:

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[22] Gibb, op.cit., pp. 885-886.

[23] This personality trait is defined in terms of talkativeness, cheerfulness, geniality, enthusiasm, expressiveness, alertness, and originality.

[24] Gibb, op.cit., p. 889.

[25] Robert F. DeHaan, "Social Leadership," Education for the Gifted. Fifty-seventh Yearbook of the National Society for the Study of Education. Chicago: The University of Chicago Press, 1958, Chapter VII.

> It is probably true that the individual traits or characteristics described above do make a person outstanding in some way and thus are related particularly to headship (leadership which grows out of the formal organization of the group). Individual traits which make a person prominent place him in an advantageous position to be elected or appointed as the popular leader. These traits, however, do not necessarily make him a better task specialist or socioemotional specialist in face to face groups. In formal-group audience situations and in public life, however, such individual factors are obviously important for election or appointment to headship positions.[26]

It is clear, according to DeHaan, that leadership is not a unitary trait or ability but, rather it is made up of personal abilities and traits plus consistent performance as a socioemotional specialist and a task specialist.

There appears to be general agreement, then, that leadership is not a unitary trait but rather that it varies in accordance with the nature of the group and of the situation. Excluding those activities of a primarily physical and mechanical nature, it might also be said that the leader tends to be somewhat above other members of the group in general intelligence but only in rare cases does a person attain leadership in a group where the intelligence of the members is far below that of his own. It should be added, however, that a number of authorities distinguish between the leader who helps to stabilize and assist the group through his skill in human relationships and the leader who focuses on the problem at hand and brings forth the greatest number of constructive suggestions and ideas. Both types of leaders are necessary to an effective group situation and on occasion--

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[26] Ibid., p. 137.

although this is relatively rare--both qualities can be found in the same person. More often than not, too, the leader is possessed with self-confidence, enthusiasm, and at least an average degree of aggressiveness and desire for recognition.

Preliminary Discussions of "Talented Behavior"

In December, 1958, the entire faculty of The University School participated in a preliminary discussion of the behavior of unusually talented individuals. Following a progress report on the study and a discussion of next steps, the total faculty was divided into groups in terms of fields of specialization--science, mathematics, language arts, social studies, related arts, music, and physical education. Each group was asked to describe the behavior of the unusually talented individual in the particular field of specialization--making as many specific statements as necessary (and possible in the time available) to describe the behavior of the unusually talented individual. The elementary staff and other generalists were asked to describe the behavior of individuals with unusual leadership talent. Following are the preliminary behavioral descriptions provided by the faculty of The University School:

Science

The unusually talented individual:

1. Has superior mental potential.
2. Has superior verbal and mathematical skills.
3. Asks questions which signify (relative to peers) mature concepts have been formed.
4. Can connect new facts with his conceptual scheme, i.e., he can organize his conceptual scheme of knowledge so that he is satisfied.
5. Becomes excited when facts seem to contradict. He looks for alternative explanations that would explain the apparent conflict.
6. Persists in the quest for certainty.
7. Frequently improvises needed equipment or instruments from available odds and ends.
8. Can apply principles in science to new problematic situations.
9. Becomes excited when puzzled by a problem in science. In this excitement one can observe a kind of happiness rather than a worry.
10. Involves himself as a researcher in science rather than as a student.

Mathematics

The unusually talented individual:

1. Organizes past information and experience in such a way as to develop general new relationships.
2. May be either disinterested or even unable to apply or transfer the mathematical techniques with which he works to everyday problems of living.
3. Tends to be (become) an extreme introvert or extrovert, socially.
4. Does not limit his study to the minimum standard set for him.
5. Is self-driven to locate relationships and to increase his storehouse of mathematical information and experience. (Drive to see relationships.)

Language Arts

The unusually talented individual:

1. Even though he works independently comes often to the adult for advice, though this too is self-initiated.
2. Works independently, has intellectual curiosity, both aimed at self-improvement. He often goes off on tangents, out on a limb. He is willing to take a chance, though always willing to admit error and get back in the groove. The talented student can always accept failure.
3. In reading: is able to read more mature and abstract books; reads widely; he checks a reference from a teacher and evaluates it; takes suggestions readily and pursues them critically.
4. In reading: sees more than just the story; he relates it to writing, to other books, to literary criticism, to style.
5. In writing: is sensitive and perceptive and he handles his materials in less conventional ways. He is linguistically advanced; he is able to use more complex language structures, more precise and vital words. He is interested in words.
6. Is a keen listener, a good observer.

Additional Comments:

You can be talented and efficient and productive; you can be talented and inefficient and here perhaps the question of development of talent is a matter of channeling the talent.

Social Studies

The unusually talented individual:

1. Must see cause and effect relationships. Perhaps one important point is that motivation for the talented comes from a feeling of pleasure. The talented may seek real life experiences which go beyond the primary motivation.

2. Has broad interests (in this field). In the social sciences all sources of interest and experience can be useful.
3. Has an understanding of and a sensitivity to other cultures.
4. Helps the group sharpen and define both problems for himself and for the group (group leader).
5. Has the ability to find the solution to problems through sustained application--if you wish, problem solving ability.

Art

The unusually talented individual:

1. Has good manipulative ability, facility with his hands and good coordination.
2. Has the ability to visualize the problem, to conceive of ramifications, to plan.
3. Has the ability to translate from the idea to the finished product.
4. Must have high interest, curiosity and desire to experiment.
5. Requires very little teacher direction, is capable of taking suggestions, grows very rapidly in ability to handle materials and tools--fast learner in this field.
6. Probably has ability to abstract ideas from his own experience.
7. Has imagination and ingenuity.

Additional Comments:

Hard work and productivity are necessary for making the talented student recognizable--but we are not in agreement as to whether these are evidences of talent.

Music

The unusually talented individual:

1. Has neuro-muscular development which permits him to manipulate his instrument with coordination and ease. He has quick natural reflexes, even though he might (by learned behavior) not show his quick reflexes.
2. Performs music as it might be an expression of feeling, or even as a well understood pattern of sound, but NOT as an unorganized hodge-podge of notes. In other words, he sees, and re-creates, synthesizes, and integrates sounds so that they have a unity which can be communicated to others.
3. Performs on an instrument as if it were actually an extension of his own being. It is only a vehicle for expression of feeling or abstract tonal design.
4. Is often interested in learning the techniques of writing music and arranging it for various instruments as an expression of his feelings and/or an outlet for some irresistible urge to create in the sound medium.

5. Possesses a high level of craftsmanship in his music writing, but even if he doesn't enter at that level, he quickly reaches that level with or without much teacher help.
6. Comes most often from a home environment which supports and encourages his interest, but an unusually talented one will rise up and achieve even when such favorable environment is lacking.
7. Possesses a keen sense of hearing pitch differences, tonal relationships, and rhythmic patterns.
8. In a rehearsal of a group made up of average or below average performers, loses patience and seeks out others with a performance level more nearly like his own.
9. When performing in a group, is sensitive to his part in relation to the parts played by the others, and has an innate sensitivity to the intent of the composer.

Physical Education

The unusually talented individual:

1. Has determination (drive), desire.
2. Is alert.
3. Is receptive to suggestions.
4. Is responsible, punctual, regular in attendance.
5. Has good rapport with associates.
6. Is a student of the game and of strategy.
7. Is reasonably selfless.
8. Directs his emotions toward productivity.
9. Learns from his successes and failures.
10. Controls anxiety (accepts defeat or success in stride).
11. Has great energy.
12. Possesses the quality of being able to motivate and inspire associates (constructive influence).
13. Reveals impatience with peers.
14. Reflects confidence.
15. Has at least a minimum amount of physical skill and co-ordination.

Leadership

The unusually talented individual:

1. Has a great deal of curiosity about things.
2. Is eager to learn.
3. Is willing to try new things.
4. Has a fairly high general intelligence.
5. Is a good organizer.

Additional Comments:

1. A basic question--In describing the behavior of the individual with unusual leadership ability are we thinking of:
    - a. The verbal person who has and expresses good ideas.
    - b. The person interested in moving ahead in his individual pursuits with uneven participation in group affairs.
    - c. The person who tries to pull the group together either through behavior or verbal expression. (He can formulate problems and move toward hypotheses).
    - d. The popular individual.
    - e. The leader who knows how to choose co-workers,... and enlist use of criteria in terms of job to be done.

2. Assumptions
    - a. Children's values change from level to level of development.
    - b. A continuous struggle for status and stature goes on whether consciously or unconsciously.
    - c. Changing environmental factors are strongly influential and to a great extent in the hands of the teacher.

3. Generalization
    A strong sense of social responsibility is operating in leadership--followership roles.

A Questionnaire Study of Talented Behavior

Late in the Autumn Quarter, 1959, approximately 140 members of the Ohio State University faculty (from the Departments of Mathematics, Chemistry, Physics and Astronomy, Geology, Geography, Botany and Plant Pathology, Bacteriology, Physiology, Zoology and Entomology, History, Economics, Sociology and Anthropology, Social Administration, Political Science, English, Speech, Romance Languages, German, Accounting, Business Organization, Journalism, Architecture, Ceramic Engineering, Electrical Engineering, Industrial Engineering, Mechanical Engineering, Metallurgical Engineering, Agricultural Biochemistry, Physical Education, and Education and from the Schools of Music, Fine and Applied Arts, and Home Economics) were requested to provide behavioral descriptions of individuals whom they considered to be unusually talented in their field of specialization.[1] The descriptions were to be written as a series of specific statements--as many as the respondent felt necessary to describe the behavior of the unusually talented individual in his field of specialization.

Seventy-~~four~~ six faculty members (54%) responded to the questionnaire. The responses were analyzed where possible in relation to the areas utilized in connection with the survey of the literature. A brief analysis of the descriptions of "talented behavior" in science, mathematics, language arts, social science, art, music, physical education and athletics, speech and dramatics, and mechanical arts follows:

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[1] Copies of the questionnaire and the letter which accompanied it are included in the Appendices.

Science

There were seventeen descriptions of the individual unusually talented in science. These were provided by faculty members representing the physical sciences (chemistry, physics and astronomy, and geology), biological sciences (botany and plant pathology, zoology, physiology), science education, and engineering. In general, the following characteristics of the individual unusually talented in science were emphasized: avid interest in science, thorough knowledge of the field, interest and knowledge outside the field, knowledge of cognate and tool fields, competence in oral and written communication, persistence, drive, diligence, orderliness in planning and executing tasks, critical thinking, experimental attitude, curiosity, insight, intellectual honesty, autonomy, sensitivity to problems, skill in problem solving, and open-mindedness. Contact with an inspiring teacher was frequently mentioned also. A high general intelligence may be inferred from many of the behavioral statements, but it is interesting to note that only the responses from the biological scientists stressed this point. There seemed to be little agreement in the area of social relations. Some individuals responding to the questionnaire pointed out that the social life of those unusually talented in science is normal, but the majority seemed to report a rather low level of interpersonal relations and interest in community affairs. On the other hand, the talented individual frequently was described as being alert to the contributions his field of specialization might make to society.

Miscellaneous Comments:

> The unusually talented individual has the simplicity to wonder, the ability to question, the power to generalize, and the capacity to apply.

The unusually talented individual is busy--and efficient. He is orderly of mind, in work habits and in play. His satisfaction is found in accomplishment--he relaxes but doesn't make a profession of it. He doesn't expect or seek admiration and public acclaim, he does well to satisfy his own motivations to use his talents well.

The unusually talented individual is good at many things beside his speciality--if he plays bridge it is done well, if he walks to work it is done with vigor and a purpose, in conversation he listens and is listened to. Interest, energy and time, not ability, are restrictions on what he does.

Essentially he gets things done in a superior manner both qualitatively and quantitatively by applying his talents and energy efficiently. His talents are usually evident, but as an individual he is indistinguished from the man who sits next to him in church or at the club. The odds are though that he is more generous at the collector's plate and in his other non-monetary services than the fellow with more time and earthly possessions.

Every such individual I know has structured his thinking primarily in terms of the statement of problems. Background factual information is, of course, brought into the picture, but the clear, concise statement of problems is pre-eminent.

...I am convinced that indices of talent are not to be found in the external behavior and characteristics of individuals
...Your questionnaire strikes me as being equivalent to judging a book by its cover, and I suggest that it is probable that you are approaching this investigation from a direction that would yield you little satisfaction..

...an individual's talent does not usually show up unless he has certain attributes which do not appear to be correlated with intelligence or creativeness. Among these attributes are aggressiveness (in the intellectual sense), mental and physical stamina, zealousness with regard to work, a kind of compulsiveness about the details of the work, etc....

...I seriously doubt that a proper evaluation can be made at either the high school or undergraduate college level. Some indication may be forthcoming during the latter years of graduate work...One may expect on a statistical basis greater contributions from the individuals with superior academic records. I do not regard this group as unusually talented.

> The unusually talented individual can apparently sniff out those problems which can be solved, and wastes little time on those which for the present seem likely to yield little reward for the effort required. Sometimes this selection is based on hunch, sometimes on reason, but usually on a non-rational blend of both.
>
> The unusually talented individual may find it hard to engage in thoughtful conversation on debatable issues with absolutist people, such as some clergymen, physicians, military men, etc., although personal relations with such people are usually quite cordial.

Mathematics

Four persons provided descriptions of the individual unusually talented in mathematics. It is difficult to generalize on the basis of so few responses, but there did seem to be an agreement on the following characteristics: an insatiable curiosity, a high degree of interest, impatience with routine, ability to see relationships and to make generalizations, ability to deal with abstractions, high reading ability, critical thinking, effective communication of ideas, and discipline in organizing to do a job.

Miscellaneous Comments:

> The unusually talented individual perceives the interesting and relevant aspects of mathematical situations, while the rest of the class reacts with uniform indifference to routine and prominent features alike.
>
> The unusually talented individual is eager to take advantage of the competence and experience of the instructor, and prefers even "a poor course under a good man" to "a good course under a poor man."
>
> ...Such students (in the "one out of a hundred thousand") are easily identified in mathematics by their ability to grasp abstract concepts. Such students are able to see immediately mathematical relations which remain obscure to average students even after much study and effort. Usually these students are much more interested in the theoretical aspects of mathematics rather than the practical or technical aspects.

> The unusually talented individual may manifest his talents in mathematics through an extremely wide range of behavioral patterns. He may be an extrovert, or he may be an introvert. He may be a leader, or he may prefer to walk alone. He may be bold and arrogant, or he may be shy and humble...
>
> The unusually talented individual exhibits proper respect for highly competent instructors because as an eager learner he understands the high price to be paid, in terms of time, effort, and social and financial sacrifice, for a high degree of professional competence.
>
> Especially on the graduate level, below average students in a class may drag down the level of presentation to such an extent that the effect upon the unusually talented student is demoralizing. I feel that beyond the sophomore year special grouping of exceptional students is vital. On the graduate level, selectivity in admission procedures should be enforced with the greatest possible emphasis. To what extent the preceding comments are applicable on the high school level, I have no way to tell. But I would be surprised if these very same comments had not occurred to competent high school people.
>
> The individual unusually talented in mathematics usually is talented in any other fields which interest him...usually he does not specialize in mathematics.

Language Arts

Eleven descriptions of the unusually talented individual were provided by members of the Departments of English (five), Education (one), Journalism (one), Romance Languages (two), and German (two). Among the most-mentioned characteristics of the unusually talented individual were: intense interest in his field, sensitivity to language, breadth of knowledge and interest (other than his field of specialization), creativity, insistence on order, organization, competence in communication - especially in writing, curiosity, inquisitiveness, sensitivity to problems and issues, high reading ability, compulsion to read, drive. In the description of the individual unusually talented in foreign language there was a tendency to stress such things as power of imitation, aural and visual memory, and a natural curiosity about words as well as the characteristics listed above. Alertness, keenness of observation, ability to size up situations quickly and accurately and to write rapidly were emphasized in the description of the individual unusually talented in journalism.

Miscellaneous Comments:

> ...Those who seem talented in German seem to be talented in other areas as well; interest, motivation, and ability to define goals seem to make the difference...
>
> The unusually talented individual interrelates knowledge from various fields, whether acquired from personal experience and observation or from reading..reintegrates knowledge acquired into his own system.
>
> The unusually talented individual is, I suspect, intensely interested in what he is doing, whenever he is exercising his talent, very much on the qui vive emotionally and nervously--though I am also sure that none of this excitement need show outwardly, need to be observable by someone else....I feel sure, though, that when a talented person is expressing his talent, he has lost any sense of himself: That is, that whatever he is doing takes on a life and a shape of its own--and can do so precisely because the talented person is capable of objectivity, of that detachment which is the essence of any valid creation. To put this in another way: such a person is profoundly critical at the moment of expressing his talent, has the capacity to take up a position at some psychic distance from his ordinary self...
>
> The unusually talented individual is obsessed with order. Disorder in thinking, writing, feeling, in art, architecture, politics, disturbs him. He may not be a reformer, but in his own work and his work with students he insists on order. This often makes him a severe teacher. It also makes him unsentimental; though he values emotional responses and encourages them, he insists that they be ordered by reason.
>
> This person also has skill in human relations, tact and diplomacy in dealing with others, a talent for making everyone feel at ease.

Social Science

Fifteen social scientists (from the Departments of Economics, History, Political Science, and Sociology and Anthropology) provided descriptions of the unusually talented individual in their fields of specialization. There seemed to be considerable agreement on the following characteristics: breadth of interest (fields outside of the field of specialization), inquisitiveness, spirit of inquiry, insight, originality, autonomy, keenness of observation, competence in self-expression, sensitivity to problems, skill in problem solving, maturity of judgment, intellectual integrity, persistence, dedication, a social concern--sensitivity for inner workings of people and of situations and institutional structures, and a willingness to take a stand on issues. The economists seemed to emphasize another characteristic as well--ability to think in quantitative terms, a mathematical "turn of mind."

Miscellaneous Comments:

> ...unusual talent in my field is conceived by me to fall into ability to play an effective leadership role. The role is the talent and the talent is the role.
>
> We expect the unusually talented individual to have come or be in process of coming to terms with *self*. This implies a rigorous self-analysis concerning capabilities, limitations, fear, hates, frustrations, etc. And, having come into some knowledge of self, he is expected to be able to manage himself before attempting unduly to influence others. This means, of course, that he shall by now be skilled in relating himself - philosophy-wise and action-wise - to the larger wholes of which he is or will be a part. Searching analysis of what a favorite teacher of mine once called "What I believe, by golly and why," is a foregone expectation...
>
> The unusually talented individual has some skills which enable him to subordinate *doing* to *thinking* about alternative ways of doing and to *choosing*.

> The unusually talented individual has been greatly influenced by his own economic, political and social environment. Not surprising in the social sciences, but it has meant that as individuals they have had a capacity for responsiveness and critical reaction which is essential to the craft of economics.

> The unusually talented individual has had a certain quality of "detached involvement," which means that the thinker is troubled by the humanitarian; one effect has been the unreconciled relations between analysis and policy.

> The unusually talented individual has not demonstrated as a child or young person any easily decipherable interest in or capacity for economics, but as indicated above, he will likely have demonstrated mental traits and interests which can be turned towards economics.

> These five persons...might fit your "talented individual" group. They rate as follows: one-introvert, a worrier, not very happy in a group, cautious, thrifty; two - rather quiet, introspective, competent in meeting problems but not aggressive; two rather gregarious, make friends easily, good classroom personalities (one of them rather free with money but not extravagant). Three rather liberal, politically, two quite conservative. Four have imagination in a high degree, the fifth moderately. All have a sense of humor. Figure this out.

> I am puzzled by your questionnaire. Are you trying to determine the nature of talent - what talent "is" - or are you trying to find out what people mean when they use the word "talent"? It is simply not clear. And these are two very different things. "Talent" is, moreover, a cultural concept, which means that talent is defined very differently by different people in different contexts. In my own field, some of us have talent for describing things; some for analyzing; some for theorizing, etc. In the last analysis, how does the "talented individual" differ from the "very intelligent individual"??? Or the "gifted", the "competent", the "good", the "productive", the "creative," ad infinitum. Like "talent", these are all vague cultural concepts, and very careful definition has to be made before research can be done.

Art

Descriptions of the individual unusually talented in art were provided by specialists in ceramics (two), sculpture (one), painting and drawing (one), and art education (one). On the whole, there seemed to be agreement that the unusually talented individual might be characterized in terms of: imagination, originality, autonomy, discipline, flexibility, fluency, organization, efficiency, intensity of effort, experimentation, questioning, involvement, willingness to assume risk of failure, ability to express his ideas and feelings, ability to make value judgments, and openness to new ideas.

Miscellaneous Comments:

> The unusually talented individual is frequently erratic - he varies a great deal in what he does and the way he handles himself. He may also function as a well behaved person - generally he will not make any extra-ordinary demands on his teacher or others. But one will also get the reverse. At times he appears to be completely dedicated to his work but one must make a careful judgment of his result. At times this indicates industry but not talent.
>
> I would say that it is practically impossible to construct a conceptual model of talent that would apply to many cases. I feel that talent adjusts itself to the situation and rarely repeats itself. In fact, it adjusts itself each time and in a different way - functioning differently each time. In fact, it is very similar to the creative process itself, a constant shifting and readjustment. He is not always a hard worker - but he does work with a higher degree of intensity than others if only for a short time. I think he is found rarely - but his results identify him and I am not sure that his behavior is a means of recognizing him.
>
> The unusually talented individual is often quite a normal human being and we generally identify him by his extra-ordinary performance. Slow, even steady growth is what I look for - it is practically impossible to say how much one can grow.
>
> The unusually talented individual creates through a process of critical judgment. Although he decries order as typified by numerical systems, the very nature of his work demands order and he achieves it (in a successful work), through the process of making conditioned judgments.
>
> The unusually talented individual is afraid of statistics; in fact he is afraid of numbers. His world is qualitative rather than quantitative.

> The unusually talented individual is not group centered. Art is not done in committee.
>
> The unusually talented individual encompasses a seeming contradictory (or paradoxical) set of dimensions: 1) he is flexible in his thinking and acting, able to react to multiple possibilities; he is also the kind of person who can reach "closure" to enable his acting: 2) he is accepting of novel and original ideas; willing to entertain the unusual, the mysterious, the unconventional; he is also a person with a sense for tradition, for the knowledge and understanding and appreciation of a discipline; 3) he is completely involved in what he is doing (has a feeling for the moment); he is also able to develop the distance to see his work in its entirety (the distance that enables seeing things in broader relationships).
>
> The unusually talented individual is not object-centered but is more objective sensitive.
>
> The unusually talented individual can "hold" form and content, process and object, and purpose and action in field.
>
> The unusually talented individual has a great curiosity about how things can be rather than how they've always been.
>
> The unusually talented individual generally "revolts" against the usual, the ordinary, the safe.

Music

Two members of the faculty of the School of Music provided descriptions of individuals unusually talented in their field of specialization. While it is not appropriate to generalize on so few responses, it is possible to note several characteristics which were emphasized by both respondents. These included: intense interest in the field, respect for the attainment of others, drive, discrimination, and ability to react to changing situations.

Miscellaneous Comments:

> ...He loves to practice; in other words, he cherishes the process over the product. He looks way beyond his assignment. He doesn't fatigue as easily as others for he

> doesn't resist the drive to work. He tends to neglect things he feels are non-essential and often (for he is young) misses something he needs for growth.
>
> He gives the feeling he knows where he is bound. He doesn't seem afraid of life. He isn't "preparing for life" he's living now. He isn't very mercenary - he is not a "pro" in that respect.

Speech and Dramatics

Descriptions of individuals unusually talented in this general area were provided by specialists in theatre, speech, and speech education. The four responses received seemed to focus on the following characteristics: sensitivity to life - people and situations, emotional responsiveness, creativity, self-criticism, independence, nonconformity, self-discipline, organization, concentration, involvement, flexibility, curiosity, knowledge of the "tools" of his field, gregariousness, inquisitiveness, compulsion to work in his chosen field.

Miscellaneous Comments:

> The unusually talented individual is prone to experience greater "highs" and "lows" emotionally than the average person. The best actors seem to have a strain of melancholy as well as tremendous exaltations.
>
> The unusually talented individual has retained something of the naivete of childhood - hasn't lost love of "make-believe"--sees life as series of "scenes"--is not bored or blase about living.
>
> The unusually talented individual has developed an intense concentration and thus can give himself up completely to task at hand. Can make a "total" response (bodily and emotionally) to imaginary stimuli.
>
> The unusually talented individual has achieved a degree of self-mastery. Thinks of his voice and body as instruments which he must control.
>
> The unusually talented individual is a critical and creative thinker in many types of situations. He knows the need for data, many ways of getting it, has a sense of discrimination, can analyze and synthesize data, draws influence carefully, knows how to check his thinking, to delay decision, and how to proceed with qualification.

> The unusually talented individual has a rich emotional as well as intellectual life, appreciates the arts, devotes his efforts to worthy causes, can withstand pressures and rise above crises.
>
> ...sensitivity to "orchestration." Words, actions, ideas develop at a tempo which has variety in speed, volume, intensity and mood. These he senses or may even demonstrate unconsciously.
>
> The unusually talented individual..often we find such talent in an individual who likes to "get away from himself," who likes to try on the other Indian's mocassins. He may enjoy satirizing the actions or habits of others. This is not the surface imitator, but the selective imitator. Like the other artists he selects, exaggerates and focuses attention on the part to be interpreted.
>
> ...He is an individualist. At times he will join with other individualists to blend an effort into artistic whole. He knows, however, that he must retreat from the "committee" or "community" effort long enough to create as an individual. Being apart does not bother him.

Dance

One member of the Physical Education Department (Women's Division) described the individual unusually talented in dance as follows: shy in a non-performing group; confident and poised in appearance in a performance; tolerant of the less gifted; able to direct the observer's attention to the subject rather than to himself; annoyed with committees--preferring to work alone; exhibiting leadership with quiet force rather than noisy bluster; flexible --able to adjust to the unexpected; energetic; not prone to accidents; exhibiting no wasted motion or random movement.

Mechanical Arts

Two responses provide some clues as to the behavior of the individual unusually talented in the mechanical arts. The behavioral characteristics emphasized by the specialist in vocational trade and industrial education and the specialist in industrial arts education who responded to the questionnaire include: interest in mechanical things, inquisitiveness, ability to define and attack problems, ability to apply scientific and mathematical principles, and manual facility.

Miscellaneous Comments:

> The unusually talented individual is not discouraged when plans fail to produce desired results.
>
> The unusually talented individual will choose an alternate plan when the first choice fails to work.
>
> The unusually talented individual accepts the idea of deferred values.

Physical Education and Athletics

Of the six responses which were placed in this category, three described the unusually talented athlete, two focused on the teacher of physical education, and one described the potentially talented athlete. There seemed to be fairly general agreement among the ~~five~~ six respondents on the following characteristics: alertness, quickness of reaction, neuro-muscular skill, ability to make decisions, conceptualization of skills, drive, aggressiveness in striving for goals, social adjustment, physical and psychic energy, and self-assurance. However, there was some difference of opinion, particularly among those describing the unusually talented athlete, as to the unusually talented individual's persistence in attempting to improve his skills. In one case, for example, the unusually talented athlete was described as "careless in the learning of basic fundamentals because he can get by without them." Several other responses described the unusually talented athlete as having a great desire to improve his skills and "willing to practice long hours to achieve his objectives."

Miscellaneous Comments:

> The unusually talented individual is usually more alert to what is going on about him in his surroundings and likewise oftentimes, but not necessarily, possessive of greater than average capacity to learn.
>
> The unusually talented individual displays personality characteristics more often associated with leadership ability.
>
> ...teaches for a kinesthetic awareness rather than the mere mechanical process of the moving body.
>
> The unusually talented individual in physical education is the teacher who is careful of his own personal and public relationships with others. His language is good; his dress is acceptable; his professional habits are noteworthy for their dignity; he attends meetings on time; he carries his load in committees; he participates in the general life of the school; he acts and looks alert and as intelligent as the Lord will permit him!
>
> The unusually talented individual in physical education is the teacher who is able to get the students to conceptualize or intellectualize the skill which they are learning. For example, the football coach who has his team discuss the whys and wherefores and purposes of the game as well as merely teaching them how to play it is one who is truly doing an educational job.
>
> The unusually talented individual usually works himself up to an emotional pitch before an important contest.
>
> The unusually talented individual quite often shows nervousness (emotional drive) through his voice, his hand movements, etc.
>
> The unusually talented individual must be made cognizant of his unusual talents and then he must be motivated to live up to them if he is ever to realize his full potential.

Leadership

There was no attempt in this questionnaire study of talented behavior to solicit descriptions of the behavior of individuals with unusual leadership talent. However, two responses do tend to describe the behavior of individuals with talent in this area.

The following comments were abstracted from the response of a specialist in one of the social sciences:

> The unusually talented individual exudes a non-judgmental attitude and is a ready rallying point for people in trouble. They can sense that he is in their corner.
>
> The unusually talented individual creates a climate and an atmosphere for people who rally around him. He gives them the ego support they need.
>
> The unusually talented individual has the capacity to act in a natural informal leadership role--as if his friends and clients insist on his giving them guidance and direction.
>
> The unusually talented individual gets his main satisfactions from the improvement of the people he touches.
>
> The unusually talented individual has the acquired or natural gift for tolerance, patience, and faith in people.

The following comments were abstracted from a response describing unusual talent in college administration:

> The unusually talented individual has to some degree... inquisitiveness, obsession with order, and wide interests. ...No organization is perfect, and it will never be improved by an administrator who is satisfied simply to carry out established routines.
>
> The unusually talented individual must have abundant physical and intellectual energy, for the effort required to make desirable changes in established institutional patterns is enormously taxing to the brain and the body. An ability to detach himself from his work completely when the time comes for recreation is very helpful and may prolong his life and will certainly make him more effective when he is working at his job.
>
> The unusually talented individual must be willing to sweat over details. Unless he does, any brilliant inspirations he has will likely prove fruitless when they are confronted by red tape. He can delegate the responsibility for some of the detail work, but not for all of it. His skill in choosing what to delegate may mean the difference between effectiveness and failure.

> The unusually talented individual has courage. It may seem melodramatic to say so, but he is being constantly judged and only an insensitive person can bring himself to risk certain criticism for very long; but the job calls for sensitive people. Therefore, he must have the courage to act even when he knows that he will have to bear the burden of criticism bordering on hate.
>
> The unusually talented individual is "diplomatic". He gives those who disagree with him every opportunity to present their case; he studies it carefully; and he answers them with moderation. Nevertheless, he does not smile his own convictions away simply to be polite; he changes them if they're wrong. When control of a situation is needed, he controls it in as temperate a manner as the situation allows. Neither an autocrat nor a milquetoast, he walks a slack wire.

Other Areas

A specialist in distributive education described the individual unusually talented in his field as: outstanding in oral communication; having an understanding of "financial details" concerning business management; appreciative of color and its proper usage; having an understanding of people and their problems; confident in himself; and, imaginative.

A specialist in foods and nutrition stressed that the individual unusually talented in this area "has to be a person who would be talented in any area he chose." Among the more specific statements describing the unusually talented individual were the following:

> The unusually talented individual understands the chemical and physical bases (as far as we know them) underlying life and interprets the biological happenings about him on these bases.
>
> The unusually talented individual accepts the limitations, challenges, and opportunities imposed by the kind of world we are a part of and builds a worthwhile life philosophy upon this foundation.

> The unusually talented individual continues to study and grow in knowledge and wisdom.
>
> The unusually talented individual is willing to work and to program his life so that he guards his health and efficiency.
>
> The unusually talented individual has a wide perspective and anxious to help solve his neighbors' or other nations problems involving physical or mental welfare.
>
> The unusually talented individual is alert to his own and to others' nutrition problems.
>
> The unusually talented individual is interested in many areas and fields, related or unrelated to foods and nutrition.

One person, who for some years has been involved in the development of an "Honors" program in the Arts College, described in some detail the individual with unusual intellectual ability (academic talent). Following are his comments:

> The unusually talented individual is, of course, alert and unusually endowed; but there are so many differences in the characteristics, the personalities, the previous experiences of talented students that generalities are apt to exclude cases of real talent, and to include cases of mediocre talent. Shyness, various blocks, lack of experience in self-expression under capable guidance, poor schooling, health deficiencies (including mental health) poor environment, including a low opinion of "egg-heads" (a phenomenon very frequent in our American social system) and school environment, these are some of the reasons why unusual gifts often remain hidden for some time. I have seen some striking examples of this.
>
> On the other hand, seemingly unusual gifts sometimes turn out to be illusory, based on brash self-assertiveness, due often to the student having been overrated in a mediocre group, but also often to a natural glibness and good training in public appearances, broad participation in public activities. Hence necessity of long observation, by teachers and counselors.
>
> The unusually talented individual is NOT necessarily an unusually broad-minded individual upon coming to us. He often has been conditioned by a narrow and intolerant climate in community, home or both, and his very

abilities tend to make him more dogmatic than others. We have been struck by this in every one of our Arts Survey courses for gifted students. Only by carefully following up the individual student can this be corrected.

The unusually talented individual is not necessarily deeply interested in a wide range of subjects upon coming to us, or even later on. Here again, wide diversity in characteristics. The very exceptionally gifted tend to have a broader field of interests, but even here, some are quite limited in the area of their talents and interests but able to go far in that area. These are preliminary and negative factors needing to be kept in mind, important to correct, involving careful individual exploration and follow-up.

The unusually talented individual tends in relation to society to take one of two tendencies, depending on whether he is an "extrovert" or an "introvert". While he is apt to be much more of a conformist than one would suspect, when he comes to us, above all because we tend to put "cooperation" above judicious choice in our national hierachy of values, he will in general be an individualist who, if an extravert will tend to wish and try to dominate, to be a leader, and if an introvert will tend to rebel against society, not necessarily or usually actively but inwardly, to withdraw and resist group pressures. Neither of these phenomena is wrong per se, but both can become so very easily. Hence again the importance of enlightened guidance.

The unusually talented individual, since he is an individualist usually, as indicated above, and since he knows he is different from others, also because he is jealous of his rights and of his "uniqueness", is apt even when an extravert to wish to "go it alone", somewhat hesitant about welcoming the opportunity of joining a group of equally gifted fellow-students, the very thing that he needs most. Once in such a group he usually becomes enthusiastically part of it, hence the importance of "selling" him the advantages of such a group, and providing such a group. The unusually talented individual unless he has some block or is overmodest, retiring, tends to jump rashly into discussions and insist on his point of view with vigor and often considerable ability. Since the position taken may be quite erroneous, and since his ability alone can make it sound convincing, it is essential that he he challenged by others and directed by older and wiser heads. The superior student group again here plays a capital role.

The unusually talented individual tends to have a rather thin skin, partly because of the general public attitude towards the "egg-head" and because he knows he is gifted. If unwisely discouraged or subjected to sarcasm he may become resentful. He must be shown his faults and errors, but also his qualities, and be strongly encouraged to participate more and more effectively in group participation and in individual exploration under superior guidance.

The unusually talented individual resents being held back unduly, and thrives on challenging and original tasks. He is capable of efforts and development far beyond that of the others, yet our system is based on letting the mediocre set the pace. The result is frustration, disgust, often loss of interest. The only solution I know is the development of an effective program for such students involving both individual study programs and special classes, these latter involving both "fast sections" for regular classes and special courses where they will be brought together under the very best teachers available, and given the best opportunity possible to develop to the maximum of their abilities. For some this means telescoping course sequences, for other encouraging independent explorations on an individual or proseminar basis, not acceleration but exploration in greater depth. And for all, it necessitates spotting their talents at the earliest possible moment and providing appropriate means for developing them.

The unusually talented individual can almost without exception be brought to understand, whatever his original attitudes, that only the adults of broad and genuine interests can live the full life, and that the earlier college years should be spent in establishing that broad base. But such an understanding can be attained with most gifted youngsters only by dint of much patience and wise direction. The specialist has been so glorified, and not without reason, and able youths are so impatient to develop their special gifts in their special direction that this is a major and important problem to be handled at the earliest moment.

PART V

THE REVISED MODEL OF TALENT

The model presented here is a description of "talented behavior". It represents an attempt to come to grips with how the talented individual relates himself to the situation, that is, how the talented individual handles himself in the situation(s) in which his talent is manifest. It was developed on the basis of: interviews, interdisciplinary discussions, and a questionnaire study involving a group of Ohio State University faculty members; a critical review of pertinent literature; and, a study of selected University High School students.

Clarifying a Concept of Talent

There are, as we have seen, various concepts of talent underlying current discussions of the development of human potential. In order to make clear the model of talent which is to follow, it seems essential, therefore, to present briefly the basic elements of the position taken here and then to attempt a definition of talent.

START

1. All individuals are capable in some area of human activity of the kind of behavior described in the model. ~~And~~, In this sense all individuals are regarded as being potentially ~~are~~ talented. There are, of course, some individuals who manifest these behaviors to a considerable extent, others to a very limited extent. *The final test of talent, however, is the proof of production by the individual.* [illegible]
2. Talented behavior is not restricted to any particular content. There is no fundamental difference ~~in~~ between talented behavior ~~as it~~ which is evidenced, for example, in painting a picture, developing a scientific principle, or discovering new procedures in human relationships, ~~Etc.~~ ~~and so on.~~

3. Talented behavior is not restricted to any particular personality pattern or life style. The individual may be, for example, an extrovert or an introvert, mature or immature, ~~etc.~~ The focus is on how the individual handles himself in the situations in which his talent is manifested.
4. Talent is not simply a matter of fixed hereditary potential. It is not something one is born with which will develop on its own. Talent is a dynamic thing, a complex product of innate capacities and an ever-changing environment and as such is subject to nurturance or inhibition.
5. Talent involves more than the intellect. It is a function of the entire personality.
6. The motivation for talented behavior is the individual's tendency to realize ~~become~~ his potentialities, to achieve self-realization, and his ~~the~~ urge to extend, develop, mature.

Talent is defined here as the emergence in action of a product growing out of the unique qualities of the individual in their interaction with his external environment--the men, materials, and circumstances in his life. The product may be a poem, a theory, a scientific discovery, a laboratory technique, a procedure in human relations, a painting, or the like. Some individuals are "idea men"; others may not be very effective in generating ideas but are quite talented in testing them out; still others are talented in the manner in which they present ideas to others. And there are some individuals who are "outstanding" in all of these respects. All of these individuals are talented. The inseparable aspects of talent, again, are the individual (his unique qualities), the process (the individual and his orientation to the situation), and the product (growing out of the unique qualities of the individual and his interaction with his environment). ~~The model of talent follows:~~

The Model of Talent — all caps

~~UNUSUAL TALENT~~

A Behavioral Description
of the
Unusually Talented Individual

no underlining

1. He ~~The unusually talented individual~~ possesses a high degree of sensitivity to his immediate and wider environment as manifested in ever-increasing identification of the self with the world of things and people.

   The unusually talented individual has an inner urge to explore his world and continuously to widen his horizons, not being content to wait until things and events crowd in upon him before he takes action. This zestful exploration may lead in the direction of new understandings of natural phenomena, new interpretations of human experience, new conceptions of the cultural heritage, and the like.

2. He ~~The unusually talented individual~~ exhibits intellectual curiosity concerning the meaning and significance of the various aspects of his environment leading to continuous extension and deepening of his perceptions and insights.

   The unusually talented individual is continuously striving to discover the meaning of things, the reasons why things and people behave as they do. To this end, he avidly seeks answers in the accumulated knowledge of race experience and utilizes the understandings gained for a more complete and satisfying world picture. He is deeply imbued with acquiring knowledge for its own sake--rather than as a means to an end. This intellectual curiosity may manifest itself in the world of the arts, science, mathematics, the humanities, and the like.

3. He ~~The unusually~~ talented ~~individual~~ is challenged rather than frustrated by doubts, uncertainties, or ambiguities in the situations which confront him and he is able to cope successfully with them.

   The unusually talented individual views life as a series of challenges. He uses these challenges as a means to further growth. Even though the odds against success in overcoming obstacles seem overwhelming he accepts them as a part of living and seeks to obtain mastery over them. These challenges may be in any area of human living, e.g., in the field of values, perhaps involving religious convictions, in the field of economic living, perhaps involving poverty and deprivation, in the field of physical health and well-being.

He

4. The unusually talented individual is skilled in identifying, defining, and clarifying problematic situations and acting with reference to them.

This characteristic of behavior is closely akin to sensitivity to the environment and to intellectual curiosity, yet it has a somewhat different connotation. It contrasts with trial and error activity which sometimes results in discovering significant problems and relationships. Situations are readily grasped, difficulties are apprehended, flashes of insight are recognized, and blocks are removed without the random activity which characterizes much human behavior. The unusually talented individual quickly goes to the heart of the situation, even though persistent search may be needed to resolve the difficulty.

He

5. The unusually talented individual makes novel adjustments to problematic situations.

The unusually talented individual does not accept routine and trite solutions of difficulties or interpretations of situations. Rather he finds new interpretations and solutions that transcend the commonplace. On the highest levels these novel solutions add some hitherto unknown element to the world of human knowledge. At lower levels they merely go beyond the individual's own experience. In either event they represent a certain uniqueness of behavior which contrasts with the habitual, the conventional, the "tried and true" solutions. This is in essence the process of reflective thinking or problem solving.

He

6. The unusually talented individual maintains open-minded, flexible attitudes toward the projected hypotheses formulated as possible solutions ~~of~~ to his concerns.

The unusually talented individual does not regard hypotheses or "guesses" as actual solutions but rather as tools for examining a confused situation. He is continuously searching for new evidence which will support or discredit the projected hypotheses. Until a sufficient body of evidence is discovered to support a given hypothesis, he suspends judgment and maintains an open-minded attitude--always willing to try out new projected solutions. He is willing in crucial situations to act on the "best" solution even though it may not be fully supported by the evidence at hand.

Hl

7. The unusually talented individual is capable of formulating fruitful hypotheses relative to the problems which he faces.

   Most individuals are capable of drawing inferences from experience, and it is through this process of one thing pointing to another that new meanings are discovered and new knowledge is gained, but as the gap between present experience and the meaning of the present situation widens it becomes more difficult to observe connections and to set up fruitful hypotheses. The unusually talented individual perceives the difference between hypotheses that have potentialities for yielding valid solutions and those which give no promise of success in clarifying the situation. For example, he does not resort to the practices of the medicine man for healing disease or for achieving his goals. He stays within the realm of observable experience that is capable of being tested.

Hl

8. The unusually talented individual grasps new insights (or concepts), relates them to other aspects of his experience, and applies them to new situations.

   The gap between the individual with a relatively low level of talent and one representing the higher range is nowhere greater than in the ability to generalize from experience and to apply the new generalization to the interpretation of subsequent experience. This ability is in essence based upon the doctrine of "transfer of training". The unusually talented individual moves from perception to conception with ease and sees almost intuitively the way the new concept relates to prior experience. With each new experience his concepts become richer and hence more applicable to new situations. Thus the creative artist is quick to see the potentiality of an idea for improving his painting. The high-level scientist grasps quickly the meaning of a slight variation in the process of experimentation and utilizes it to improve his technique. The community worker sees the applicability of a given principle of group dynamics in a group situation in which progress is blocked.

Hl

9. The unusually talented individual manifests personal integrity and self-assurance in supporting or carrying into action his beliefs, discoveries, or conclusions.

   The unusually talented individual has the courage of his convictions. He has faith in his own developing self and in the conclusions which he has reached even though he holds them tentatively. He regards his integrity as a person as a paramount value and seeks always to give expression to truth as he sees it even though he may be emotionally involved in the outcome. The creative artist depicts life as he sees it, not as he thinks others might want it to be. He makes his statement to the world and accepts responsibility for it.

He

10. The unusually talented individual manifests absorption and persistence and dedication to tasks which confront him until his goals are achieved.

The unusually talented individual sets up goals that are worthy of achievement. He knows that only by hard, rigorous self-discipline can they be accomplished. This calls for such complete dedication to the task that for the time being, the rest of the world may be shut out. Thus, the unusually talented individual is willing to forego other fruitful experiences for the sake of the attainment of the projected goal. This does not mean that he is insensitive to the world of things and people, but rather that his absorption in the task leads ultimately to higher levels of appreciation of his world and enriches his contribution to it.

He

11. The unusually talented individual exhibits control of the tools, processes, and materials which he utilizes to accomplish his goal-centered tasks.

The unusually talented individual recognizes the inseparable relationship between means and ends and seeks always to improve and refine the tools and processes which he utilizes in pursuing his goals. He knows that the excellence of the product of his endeavors depends to an appreciable extent upon the proper selection and use of his materials. A hastily contrived experimental design is not likely to result in a valid and reliable solution of a problem. Even the skill of a master craftsman cannot compensate for shoddy or inappropriate materials. The proper control of tools, processes, and materials comes to the unusually talented individual as the result of rigorous self-discipline and a desire to profit from his own and the mistakes of others.

He

12. The unusually talented individual operates in terms of a consistent personal value system that is an integral part of his total personality, controls his behavior, and ~~that~~ undergoes reasoned modification in light of new experience.

In a broad sense it may be said that every individual operates in terms of certain values which he prizes. Sometimes these values are in conflict and hence lead to inconsistent behavior. Failure to reconcile the conflicting values may even inhibit action. The unusually talented individual is aware of the significance of his value system and is constantly seeking to weave unity and consistency into his life through a critical evaluation of the things, the ideas, the standards which he cherishes. He strives to understand and appreciate the value systems of others and utilizes them to improve his own, but remains true to his personal and social philosophy.

He

13. The unusually talented individual has a sense of becoming, of personal satisfaction, of self-fulfillment.

The unusually talented individual has grasped the deeper significance of life as a continuous process of self-fulfillment which draws together the separate strands of his existence and gives meaning and purpose to his own life and, as a consequence, to human living. He recognizes that the process of becoming is continuous with life itself and is a never-ending quest. This realization provides a sense of self-satisfaction and serenity which contributes to the richness and depth of his experience and makes it possible for him to face life with all of its vicissitudes with self-confidence and assurance.

He

14. The unusually talented individual makes significant and unique contributions in one or more of the basic aspects of living.

The unusually talented individual makes a significant and unique contribution to some aspect of living, i.e., intellectual, esthetic, or practical. The final test of talent lies in accomplishment rather than in process--if indeed the two aspects can be separated. This accomplishment may take on one of many forms. It must, however, be tangible and concrete, such as the painting of a picture, the writing of a poem, the derivation of a new formula, the discovery of a new vaccine, the development of a new insight into human behavior. But in whatever field, it is characterized by its departure from conventional practices.

End

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PART VI

TALENT IN ADOLESCENCE-- SELECTED ILLUSTRATIONS

In Part V it was suggested that all individuals are capable in some area of human activity of the kind of behavior described in the model of talent. In studying talent in adolescence, therefore, it seemed advisable to select an entire grade group--this study to be supplemented by the study of a limited number of unusually talented students selected from other grade groups in the University High School.

The students selected for study included the twenty-nine members of the eighth grade class, two members of the eleventh-grade class, and three members of the twelfth grade class. In the discussion which follows the study of these students is described briefly. Illustrative case reports are included also.

A Study of the Eighth Grade Class

The study of the students in the eighth grade drew heavily upon the records available in the school's records room and upon the accumulated records passed on from one grade teacher to the next. These records provided a wealth of information concerning the students' home and family background, general intelligence, performance on achievement tests and various other tests, attendance, health, reading interests and abilities, and curricular experiences as well as the students' total development. Reports to parents--letters and conferences--were particularly revealing of the students' progress, academically, socially, and emotionally. Teacher responses to a check list of some significant indices of talent together with observations of the group in action in the classroom provided some clues concerning the extent to which the students manifest the behaviors described in the model of talent. Several tests which were administered to this group of students provided additional data concerning their educational development, study skills, reasoning ability and values. The overall findings for the entire group are described briefly in the discussion which follows.

General Background

The eighth grade group consisted of twenty-nine students, fifteen boys and fourteen girls. Thirteen had enrolled in the University School in kindergarten (four-year or five-year). Of the remaining sixteen, four had joined the group in grades one and two; one entered in the fourth grade; two, in the fifth; and, four, in the sixth. Seven members of the group had entered the school in the seventh grade. Their ages varied from twelve to fifteen years, the majority of students being approximately fourteen years old. The youngest members of the class, a boy and a girl who had been accelerated, were twelve years old.

The general economic and cultural background of this grade group was fairly typical of the school. Eleven of the fathers were on the faculty of Ohio State University; four were engineers; and six others were employed in various occupations which also required college preparation. Vocations which do not usually demand a college education were being pursued by eight of the fathers. Seven of the mothers were teaching or were enrolled in Ohio State University as graduate students. The great majority, however, were housewives.

Intellectual Ability

Every member of this class has had at least one individual intelligence test, and some have had as many as three. The test scores considered here are those resulting from the administration of the Stanford-Binet Test of Mental Ability by a member of the school staff. These tests were given over a seven-year period with approximately half of the class having been tested in the first or second grades. New members of the class were tested shortly after enrolling in the school. In some instances the examiner gave a re-test. In all cases the re-test score was higher than the original score. The higher score was utilized in this study. The scores obtained by the school examiner show a high degree of reliability when compared with scores obtained by other Stanford-Binet examiners who have tested members of this class. This same degree of reliability is found between the school examiner's scores and those obtained by examiners using the Wechsler Intelligence Scale for Children with these same students.

The average I.Q. for the class is 122 with the median at 120.5. The range for the class is from 89 to 160. The average I.Q. for the fourteen girls in the class is 121, and the range from 89 to 145. The average I.Q. for the fifteen boys is 124, and the range from 102 to 160.

Twenty-seven percent of the class have scores that fall in the average category which usually represents fifty percent of the general population. Seventy-three percent of the class have scores above 110 which is the average high school graduate's score. Thirty-five percent have scores above 130 which usually represents three percent of the general population. Twenty-five percent of the class have scores above 140 which is comparable to professional honors groups and those selected for American Men of Science listings. Two members of the class (both boys) have scores above 150. Scores this high are comparable to those recorded for people who secure honors in the best graduate medical schools or graduate law schools.

Examiner remarks indicate that, in general, the students in this class have a high degree of verbal ability and in many cases a much higher verbal than performance ability. There are no significant differences between the scores or the abilities of the boys and girls in this class as measured by this test. Using the mental age concept, this class has the intellectual functioning level of the average high school senior class. (If all members of the class were fourteen (CA) and using the average I.Q. of 122, the MA would be seventeen.)

Achievement Tests Data

Achievement tests were given to this group both at the beginning and end of each year, although occasionally one of these was missed. In the primary grades the Metropolitan Achievement Tests in reading and arithmetic were given. At the end of the second grade and in grades 3-6 the California Achievement tests in reading, arithmetic, language and spelling were given.

The testing program appeared to be less uniform after the sixth grade. The Iowa Silent Reading test was given at the beginning of both seventh and eighth grades. Both the California and the Stanford tests of achievement in arithmetic were given at the beginning of the seventh grade, and the Stanford was also given at the end of the seventh grade. The cooperative's Step in mathematics was given at the beginning of the eighth grade.

Examination of the test scores revealed that the class average generally was well above the national norms. For example, the beginning of the eighth grade, twenty-three members of the class scored at eighth grade level (37th percentile) or above on the Iowa Silent Reading Test. Nine students scored at eleventh grade level (77th percentile) or higher. The range (in grade level equivalents) was from 4.0 to 16.3, (96th percentile) the median being 9.8 (64th percentile). On the STEP (Sequential Test of Educational Progress) test in mathematics the range (in percentile bands) was from 0-18 to 99½-100, and the median band was 84-93.

Additional Test Data

Several tests in addition to those regularly included in the testing program were given to the eighth grade class in connection with this study. These included The Iowa Tests of Educational Development, The Spitzer Study Skills Test, The Watson-Glaser Critical Thinking Appraisal, and The Allport-Vernon-Lindzey Scale of Values.

Six of the nine tests in the Iowa Battery for grades 9-13 were given to this group. In general, the class was superior in educational development as measured by these tests. The class average on the six tests was at the 81st percentile on beginning ninth-grade norms and at the 47th percentile on mid-year twelfth-grade norms. More specifically, in terms of beginning ninth-grade norms, on the test designed to measure the students' general knowledge and understanding of contemporary social institutions and practices (Understanding of Basic Social Concepts) the class average was at the 85th percentile. The class average on the tests designed to measure the students' general knowledge and understanding of scientific terms and principles of common natural phenomena and industrial applications, and of the place of science in modern civilization (Background in the Natural Sciences) was at the 92nd percentile. On the test on Quantitative Thinking the class average was at the 90th percentile. On tests designed to measure the students' ability to interpret reading materials in the social studies, natural sciences, and in literature, the class averages were at the 72nd, 76th, and 76th percentile, respectively. It is interesting to note that the class average (74th percentile) on the three tests involving the interpretation of reading materials, while considerably above the national norms, is somewhat lower than the class average on the tests designed to measure the students' general knowledge, background, and skills in the so-called basic subjects such as science, mathematics, and social studies. In these areas the class average was at the 89th percentile.

The Spitzer Study Skills Test is designed to measure the skills that students have in (1) using the dictionary; (2) using the index; (3) understanding graphs, tables, and maps; and, (4) knowledge of sources of information. The class averages, using ninth-grade norms, on these four subtests were at the 70th, 90th, 70th, and 95th percentiles, respectively. The class average for the complete test was at the 80th percentile on ninth-grade norms and at the 53rd percentile for twelfth grade norms. These averages might have been even higher if all the members of the class had completed the test within the allotted time. As it was, slightly more than half of those who took the test (15 students) scored at the 92nd percentile or better. The range, however, was from the 10th percentile to 99+.

On a test designed to provide problems and situations which require the application of some of the important abilities involved in critical thinking (Watson-Glaser Critical Thinking Appraisal) the range in percentiles was from 11 to 99 on high school norms (11th and 12th grades) the median being at the 79th percentile. The average (mean) for the class was at the 77th percentile.

The Allport-Vernon-Lindzey Scale of Values was also given to the members of the eighth grade class. On this test designed to measure the relative prominence of six basic interests or motives in personality, the class average was high in the theoretical and fell within the expected range of the normal distribution on the economic, the aesthetic, the social, the political, and the religious values. The average for the boys was outstandingly high in the theoretical value and low in the aesthetic and religious values. The girls were within the normal range in all values and were higher than the boys in the aesthetic, social, and religious values--which is to be expected on this instrument. In almost all cases, the boys who scored very high on the theoretical had very low scores on the aesthetic and religious values. The girls who had very high scores on the social value tended to score very low on the theoretical and economic value. In general, however, with the exception of the unusually high score on the theoretical value, the class followed the pattern of the normal population.

Indices of Talent

Some indication of the extent to which the students in the eighth grade class manifest the behaviors described in the model of talent was provided by the responses of the eighth grade staff to a check list of some significant indices of talent. (See page 188.) Teachers were asked to indicate the extent to which each student in the eighth grade manifests the behaviors on the check list, using the following scale:

4 -- To a great extent
3 -- To a considerable extent
2 -- To some extent
1 -- To a limited extent
0 -- No basis for making a judgment

All the students in the class were rated by the teachers responsible for the general education program. (At the eighth grade level general education is comprised of core, mathematics, and physical education.) Special-interest area teachers (exploratory foreign language, related arts, home arts, music, and science teachers) also responded to the check list.

SOME SIGNIFICANT INDICES OF TALENT EXPRESSED IN TERMS OF BEHAVIOR

A Check List

Student______________________ Teacher______________________

Area______________________

To what extent does the individual:

____1. Possess a high degree of sensitivity to his immediate and wider environment as manifested in ever increasing identification of the self with the world of things and people?

____2. Exhibit intellectual curiosity concerning the meaning and significance of the various aspects of his environment leading to continuous extension and deepening of his perceptions and insights?

____3. Regard doubts, uncertainties, and ambiguities in the situations which confront him as challenges rather than frustrations, and to what extent does he cope successfully with them?

____4. Possess skill in identifying, defining, and clarifying problematic situations and acting with reference to them?

____5. Make novel adjustments to problematic situations?

____6. Maintain open-minded, flexible attitudes toward the project hypotheses formulated as possible solutions of his concern?

____7. Formulate fruitful hypotheses relative to the problems which he faces?

____8. Grasp new insights (or concepts), relate them to other aspects of his experience, and apply them to new situations?

____9. Manifest personal integrity and self-assurance in supporting or carrying into action his beliefs, discoveries, or conclusions?

___10. Manifest absorption and persistence and dedication to tasks which confront him until his goals are achieved?

___11. Control the tools, processes, and materials which he utilizes to accomplish his goal-centered tasks?

___12. Operate in terms of a consistent personal value system that is an integral part of his total personality, controls his behavior, and that undergoes reasoned modification in light of new experience?

___13. Achieve, through his accomplishments, a sense of becoming, of personal satisfaction, of self-fulfillment?

___14. Make significant and unique contributions in one or more of the basic aspects of living?

Additional Comments:

Analysis of the responses revealed that in the core class three students in the judgment of their teacher, manifested all the behaviors listed to a great extent. One student was described as manifesting the various behaviors to a limited extent. The class average for all of the fourteen behaviors listed was 2.2. The behaviors receiving the highest rating (class average) were concerned with intellectual curiosity (2.6) and self-fulfillment (2.5). The lowest ratings (class average) were given to the behaviors involving contributions to some aspect of living (1.8), novel adjustments to problematic situations (1.9), and the formulation of fruitful hypotheses (1.9).

In mathematics, the average ratings of individual class members ranged from 1.3 to 3.1. The average for the class for all of the behaviors on the check list was 2.1. The behaviors receiving the highest rating (class average) involved a consistent personal value system (2.9) and absorption and persistence (2.7). The behaviors receiving the lowest ratings (class average) were concerned with sensitivity to the environment (1.7) and with how doubts and uncertainties are regarded (2.0).

Of the fourteen girls in the class, one was described by her physical education teacher as manifesting all of the behaviors on the check list to a great extent. Only one other girl received the top rating on any one of the behaviors listed. Two girls were described as manifesting the various behaviors to a limited extent in physical education. The class average (girls) for the fourteen behaviors on the check list was 2.2. The girls' average on the behavior involving self-fulfillment was 2.8 (high). The lowest rating (girls' average) was on the behavior concerned with the identification, definition, and clarification of problematic situations (1.7).

One of the fifteen boys in the class was described by the boys' physical education teacher as manifesting the various behaviors to a limited extent. The highest average rating for an individual boy was 3.4. The class average (boys) for the fourteen indices of talent was 2.4. The items concerning personal integrity and a consistent personal value system ranked high (class average, 2.9). The item involving the ability to grasp new insights ranked low (1.3).

Twenty-seven members of the class had had an exploratory foreign language experience as part of their elective program. Two members of this group were described by the teacher as manifesting all the behaviors (on which she rated them) to a great extent (4.0). Four members, each of whom was rated on approximately half the items, manifested these behaviors to a limited extent (2.0). The group average for the fourteen behaviors on the check list was 2.8. In this connection it should be noted that the teacher indicated that she had no basis for making judgments for any of the students on the items involving novel adjustments to problematic situations and contributions to some basic aspect of living. And, only three students were rated on the items concerned with identifying and clarifying problematic situations, open-mindedness, and formulating fruitful hypotheses.

In related arts, the average ratings of the twenty-six students involved ranged from 1.0 to 3.7. The average for the group on the fourteen behaviors was 2.6. Here also, the teacher responding indicated that he had no basis for making a judgment on the item dealing with contribution to some basic aspect of living. The items concerning intellectual curiosity and absorption and persistence ranked high (group average, 3.0). The item involving novel adjustments to problematic situations received the lowest rating (group average, 2.1).

The fifteen students who elected science in the eighth grade had an average rating of 2.6 on the fourteen behaviors. In this instance also, it should be noted that the teacher responding indicated that he could not make a judgment on the item concerning contribution to some aspect of living. The group average was highest on the item dealing with intellectual curiosity (3.3). The average was lowest on the item concerned with a consistent personal value system (1.8).

Five students were rated by the home arts teacher. The average for the group was 1.6, the range from 0.9 to 2.9. And, one member of the class was described by the instrumental music teacher as manifesting the behaviors on the check list to a limited extent.

In summary, this class performs at a level considerably higher than would be expected of most eighth grade groups. The over-all performance of the class on the standardized tests of educational development, study skills, and critical thinking is comparable to the national average for high-school seniors. On the values scale (which is designed for college students and adults) the pattern of the class approximated that of the normal population; however, the score on the theoretical value was unusually high. And, the tentative ratings provided by the eighth grade staff indicated that the class members, for the most part, manifest the behaviors described in the model of talent from some extent to a considerable extent.

Selected Case Illustrations

In this section individual reports on four members of the eighth grade class are presented. Reports on selected eleventh grade students are included as additional illustrations of talent in adolescence.

MIKE. Mike, a stocky twelve-year old, has high intellectual ability (I.Q. 154 on the Stanford-Binet). He entered the University School in the four-year kindergarten. Reports by his teachers indicate that he has functioned throughout his school career in a manner very mature for his age. He dealt with problems in an abstract and intellectual manner at an early age and has always shown a high level of performance in verbal skills. He had an early interest and ability in working with numbers and scientific phenomena. He has always shown evidence of having an intense curiosity and imagination, and a keen interest in learning in all areas. Occasionally his wide variety of interests has led him astray, but with training in selectivity he has developed good work habits.

Teacher reports also reveal that Mike showed an early desire to express himself in a variety of creative ways and that he is talented in music. His imagination has sometimes led him astray in his creative writing and he has often had difficulty in confining his work to the subject being considered. He has a great fund of knowledge in all areas. He has sometimes needed considerable direction but is considered by his teachers to be responsible and self-directing in most instances. He has shown evidence of desiring freedom to delve deeply into his many interests, especially in mathematics and science. Mike has been thought of as fun-loving and quick-witted, and has been popular with his classmates. He has been careless about his appearance and his written work but has shown that he can be neat when he wants to be. He has been physically healthy and advanced for his age, and has been considered to be skillful in physical activities even though he was hampered by his weight. He has assumed leadership roles on the playing field as well as in the classroom and has always had a great deal to contribute to discussions.

There is no indication in the records that Mike has had any weakness in academic, social, or emotional adjustment to school. He adjusted readily to his acceleration from the third to the fifth grade and has functioned at a high level in this class even though he is its youngest member.

Mike's performance on the series of tests given at the end of the eighth-grade year was very outstanding. On the Iowa Test of Educational Development, for example, (using beginning ninth grade norms), Mike exceeded the norms on four of the six tests. Using mid-year twelfth grade norms, he scored at the 88th percentile in understanding of basic social concepts, at the 94th percentile in background in the natural sciences, at the 99th plus percentile in ability to use arithmetic and mathematical principles in the solution of practical problems, and at the 98th percentile in understanding readings in the natural sciences. He scored at the 95th percentile in ability to understand readings in the social studies, and at the 98th percentile in understanding various types of poetry and prose, using beginning ninth grade norms. His average score for all of the tests given was at the 90th percentile for mid-year twelfth grade. His score in mathematics exceeded the norms on this test for any grade level and it can be presumed that he can do college level work. These scores indicate outstanding achievement in all areas measured and are even more remarkable when Mike's age is considered. As the youngest member of the class (12 years, 6 months at the time of the test), he achieved at levels which exceed ninety percent of mid-year twelfth graders (average age approximately 17 years, 6 months).

Mike scored at the 60th percentile in understanding graphs, tables and maps on the Spitzer Study Skills test, using ninth grade norms. All of his other scores exceeded the ceiling on ninth grade norms. Using twelfth grade norms, he scored at the 90th percentile in using the dictionary, and at the 95th percentile in knowledge of sources of information. He exceeded the ceiling on twelfth grade norms in using the index. His total score for the complete battery is at the 98th percentile on ninth grade norms and is outstandingly high in comparison to the national norms and very far above the class average which is at the 80th percentile. On the Watson-Glaser Critical Thinking Appraisal, Mike scored at the 92nd percentile on high school norms. This score is very high in comparison with the national average, is above average on college norms, and is above the class average, which was at the 77th percentile.

On the check list of some significant indices of talent, Mike's overall average on all the behaviors listed was 3.8. In every case he was described as manifesting the behavior on the check list to a great extent or to a considerable extent. The areas in which he received the highest average ratings (4.0) were core and exploratory foreign language. (In the case of foreign language, however, he was not rated on all of the items.) In related arts his average rating was 3.9, and in science it was 3.8. The lowest ratings he received were in mathematics (3.4) and physical education (3.4).

Mike has performed at consistently high levels in all areas. He seems to have made excellent progress, academically, socially, and emotionally and is viewed by his teachers as a very well-rounded individual. His major interests appear to lie in science and mathematics, though he has demonstrated his ability in others areas as well.

MARK. Mark entered the University School in the four-year kindergarten. His I.Q. as measured by the Stanford-Binet when he was in the first grade is 117. Cumulative reports by teachers rather consistently describe Mark as very cooperative, well liked, neat, orderly and very thoughtful of others. He showed an ability in all academic areas early but especially in arithmetic in the elementary grades. By the time he reached the fourth grade he was showing outstanding abilities in the language arts. He showed an early interest in science and had many good suggestions to offer in connection with experiments. By the time he reached the seventh grade he was doing advanced work in science and was one of the most enthusiastic contributors of ideas in the mathematics class. His written work was also outstanding by this time, and his reading choices were very mature. In the eighth grade he was described as the best student in the experimental class in linguistics.

Mark has shown a great deal of imagination and ability to concentrate on details in art projects. He showed exceptional endurance and interest span in these projects and took helpful criticism well. He seems to have enjoyed this creative work and took advantage of the opportunity to express himself. He has shown talent in singing and instrumental music but is reluctant to perform alone. In physical education Mark has shown the same persistence and desire for a high standard of accomplishment as he has in his academic work. He has average skills for his age and size but he constantly seeks to improve them. He assumes a leadership role on the playing field as well as in the classroom, but this ability was late in being realized.

Mark seems to have had some emotional difficulties throughout his school years. His first grade teacher noted that he was very tense and inhibited and shy in groups. He needed more confidence in himself and greater independent action. He set unusually high standards for himself at an early age and has continued to do so. Parent conference reports reveal that Mark's teachers felt he was being pushed too hard at home. His mother, however, did not believe his standards were too high even though she pictured him as often being a "nervous wreck" over his desire for perfection. He has had a long standing eating problem which seems to stem from his desire to eat hurriedly so he can return to his studies. In the sixth grade it was noted that he had withdrawing tendencies and nervous symptoms. In the seventh grade he was somewhat hesitant about taking the iniative in various activities for fear of making mistakes. In the eighth grade he has shown evidence of being fearful of test situations and has had a tendency to "freeze". His written work has been neat but in a cramped style, and his teachers indicate that he needs to feel that he has more freedom. However, his shyness and reticence about speaking up have not kept him in the background. His classmates have come to rely on his leadership in various situations.

Mark's performance on the series of tests given at the end of the eighth-grade year was excellent. On the Iowa Test of Educational Development, (using beginning ninth grade norms) he scored at the 88th percentile in background in the natural sciences, at the 62nd percentile in ability to understand readings in the social studies, at the 21st percentile in understanding readings in the natural sciences, and at the 66th percentile in understanding various types of poetry and prose. On understanding basic social concepts and in ability to use arithmetic and mathematical principles in the solution of practical problems, he exceeded the ceiling on ninth grade norms. On both of these tests he scored at the 88th percentile on mid-year twelfth grade norms. His average score for all of the tests taken is at the 73rd percentile (using ninth grade norms), and is below the class average which is at the 81st percentile. These scores indicate exceptionally high achievement in quantitative thinking and understanding of social concepts. He also has high achievement in background in the natural sciences.

In viewing his other scores it should be noted that he did not finish the tests within time limits, but his accuracy on what he did was very high.

On the Spitzer Study Skills test, Mark scored at the 95th percentile in using the dictionary, at the 90th percentile in using the index, at the 80th percentile in understanding graphs, tables, and maps, and at the 97th percentile in knowledge of sources of information. His total score for the complete battery is at the 94th percentile, which is outstandingly high in comparison to national averages and far above the class average which is at the 80th percentile. These scores are all based on ninth grade norms. Mark finished all of the tests within time limits. On the Watson-Glaser Critical Thinking Appraisal, Mark scored at the 81st percentile on high school norms. This score is high in comparison with the national average and is slightly above the class average, which is at the 77th percentile.

Mark's over-all average on the check list of some significant indices of talent was 3.2. The areas in which he received the highest average ratings were core (3.9) and science (3.7). In physical education, related arts, and exploratory foreign language his average rating was 3.0. His lowest rating (average) was in mathematics (2.8). However, in this instance the teacher commented, "...afraid of self. Beginning to sense own ability. Will grow into real potential."

On the whole, Mark's emotional problems do not appear to have limited him to any great degree in his school work. His teachers seem to be in unanimous agreement that he has excellent work habits, a great deal of intellectual curiosity, a strong imagination, exceptional ability to summarize and evaluate, an eagerness to take on more work, a wide range of interests and skills, and an exceptionally pleasing personality. As he has come to have more confidence in himself he has overcome many of his former problems in responding in the group and has increased his active participation in leadership roles. There is some indication in teacher reports that his over-concern for perfection and anxiety over making mistakes has hidden some of his creative talent as well as causing him to hold back in class discussions. There appears to have been rapid improvement in both of these areas in the last two years.

JOAN. Joan, a vivacious fourteen-year old, entered the University School in the first grade. On the Stanford-Binet given her that year she scored 119. Parent letters and reports of parent conferences since Joan's entrance to University School depict a very capable, well-rounded girl. Many of her characteristics noted in the first grade have been maintained through the eighth grade. She has always behaved maturely for her age. This may be a contributing factor to her acknowledged leadership role within the class. This leadership has been exercised throughout her school experience. Recently a teacher stated it, "Best group organizer in class. Can direct peers: make them work and like it." This expresses well a consistently stated judgment. This natural leadership ability has probably been one of her greatest assets. Related to this characteristic has been her ability to relate very effectively to both peers and adults. She has been well liked by both.

Another strong asset running throughout the reports has been her advanced reading ability, both her understanding and skill and speed. There have been times when her choice of reading material was considered inappropriate (too immature), but that has now been corrected. She has consistently been high in spelling and in both written and oral language usage, also. Joan's study and research skills have also been very good. Frequent comments are found which indicate that she uses library effectively, uses study time effectively, works quickly and diligently and has a good standard of achievement. In recent years (especially seventh grade) several teachers suggested that over-socialization may have set in, thus decreasing the effectiveness of these skills. Indications of this are a limited attention span, and a strong tendency to converse, discuss or argue with neighbors about topics completely irrelevant to class work during supervised study or class discussion. When interested, she consistently has been a good participant in class discussions. Joan's mathematical skills and understandings have been consistently high, although probably higher praise was given in the earlier years. Her progress in physical education was only average for the first one or two years, but since then she has progressed rapidly and reached high level achievement in skills and exerts leadership in this situation, too.

Some areas in which Joan has been noted to display considerable creativity are writing, art, music, and dance. By seventh grade it was noted that she expressed herself beautifully when writing about something with which she's emotionally involved. Her art productions have been considered very good, but she seems to feel somewhat insecure in this area. Musically, she has done well since the early grades. As early as second grade it was noted that she did very creative work in both music and dance, and liked to make up interpretive dances. This interest and ability has continued throughout her school career. In the early grades she seemed to have a tendency to withdraw somewhat when facing a situation of insecurity. This has not been noted recently.

She is increasingly able to speculate and deal with abstract ideas. Her listening habits are improving, but she still has a long way to go. She has a realistic picture of herself and evidences self-direction. She exhibits enthusiasm, alertness and spontaneity.

Joan's performance on the series of tests given at the end of the eighth grade year was about average for the class. On the Iowa Test of Educational Development Joan scored at the 92nd percentile in understanding of basic social concepts, at the 79th percentile in background in the natural sciences, at the 80th percentile in ability to use arithmetic and mathematical principles in the solution of practical problems, at the 81st percentile in ability to understand readings in the social studies, at the 65th percentile in understanding readings in the natural sciences, and at the 76th percentile in understanding various types of poetry and prose. Her average score for all of the tests given was at the 78th percentile and is near the average for the class (81st percentile). These scores indicate high achievement in all areas and a very good background in the social studies. Her score in this area was above the class average.

On the Spitzer Study Skills test, Joan scored at the 75th percentile in using the dictionary, at the 90th percentile in using the index, at the 70th percentile in understanding graphs, tables and maps, and at the 40th percentile in knowledge of sources of information. Her total score for the complete battery is at the 75th percentile which is above the national average and slightly below the class average, which was at the 80th percentile. These scores are all based on ninth grade norms. On the Watson-Glaser Critical Thinking Appraisal, Joan scored at the 77th percentile on high school norms. This score is high in comparison with the national average and is average for this class.

On the check list of some significant indices of talent, Joan's overall average on all the behaviors listed was 2.5. The areas in which she received the highest average ratings were mathematics (3.4) and exploratory foreign language (3.3). Her lowest rating (average) was in core (1.5). And, her average ratings in science, physical education, and related arts were 2.4, 2.2, and 2.2, respectively.

Joan's teachers generally describe her as poised, friendly, and cooperative, an outgoing person. She is well above average academically, quite capable in study and research skills, and quite effective in relating to adults as well as her peers. Her greatest potential seems to lie in the area of leadership.

CHRIS. Chris is well above the superior range in intellectual ability. (He scored 192 on the Binet given him as a six-year old. Two years later he scored 160.) He entered the University School in the five-year kindergarten. Cumulative reports by teachers indicate that Chris has shown consistent evidence of having very superior abilities in all areas of endeavor. It was noted by his kindergarten teacher that he was sensitive to the feelings of others, a good group member, a leader, had an outstanding sense of fair play, and that the other children had a great deal of confidence in him. He showed an early interest in mathematics and science and excellent ability in both of these areas. He was advanced in the language skills and read books far above the level for his age. In the elementary grades he was from one to two years in advance of his age in all areas. In the sixth grade he was recommended for acceleration, but he and his family decided against it. Chris also showed an early interest in creative writing but had some difficulty in the elementary grades because his fundamental skills were not advancing rapidly enough to keep pace with the mature level of what he wanted to say. This same problem arose in the arts because he was thinking at such a mature level he could not express himself with the materials presented. He shows evidence of having had creative skills in all areas from an early age. He is talented in music and dance but a little shy in performing alone.

In junior high school, Chris has worked at levels four and five years in advance of his age and completed the three year mathematics requirement in two years. He has always shown evidence of a great deal of reasoning and thinking ability, and, although not very vocal, he makes excellent contributions to group discussions and his opinions have always been sought after by the group. He has a strong behind the scenes effect on the group and has been given a strong leadership role. He has a quiet sense of humor and at times has been led astray in horseplay when he was not interested in group activities. He also has excellent physical skills and is advanced for his age. He assumes a leadership role on the playing field and sets standards of fair play for the whole group.

Chris is sometimes described as being too quiet and a little too concerned with his work but does not appear to have had any emotional problems in school. All of his teachers have mentioned his maturity and social skills. He has excellent work habits and tries to do his best in all areas.

Chris's performance on the series of tests given at the end of the eighth-grade year was very outstanding. On the Iowa Test of Educational Development, (using beginning ninth grade norms), Chris scored at the 95th percentile in understanding of basic social concepts , at the 98th percentile in ability to understand readings in the social studies, at the 71st percentile in understanding readings in the natural sciences, and at the 97th percentile in understanding various types of poetry and prose. He exceeded the ceiling on ninth grade norms for two tests. Using mid-year twelfth grade norms, he scored at the 88th percentile in background in the natural sciences and at the 91th percentile in ability to use arithmetic and mathematical principles in the solution of practical problems. His average score for all of the tests taken was at the 92nd percentile (using ninth grade norms) and was much higher than the class average which was at the 61st percentile. These scores indicate very high achievement in all areas and exceptional abilities in quantitative thinking and in science.

On the Spitzer Study Skills test, using ninth grade norms, Chris scored at the 97th percentile in knowledge of sources of information. In all other tests he exceeded the ceiling on ninth grade norms. Using twelfth grade norms, he scored at the 95th percentile in using the dictionary, at the 97th percentile in using the index, and at the 97th percentile in understanding graphs, tables, and maps. His total score for the complete battery exceeded the norms for the ninth grade. This score is at the 98th percentile on twelfth grade norms, and is outstandingly high in comparison to national averages and to the class average which is at the 68th percentile on ninth grade norms. On the Watson-Glaser Critical Thinking Appraisal, Chris scored at the 85th percentile on high school norms. This score is high in comparison with the national average and is well above the class average, which was at the 77th percentile.

Chris's over-all average on the fourteen behaviors listed on the check list of some significant indices of talent was 3.8. The areas in which he received the highest average ratings (4.0) were core, science, and exploratory foreign language. His lowest average rating (3.3) was in mathematics. In related arts his average rating was 3.8, and in physical education it was 3.6. In all cases he was described as manifesting the behaviors to a great extent or to a considerable extent.

Chris appears to be far advanced for his age in all areas. There is no evidence that would indicate that he has had or will have anything but outstanding success in all aspects of his school career.

JACK. Jack, one of the most popular members of the junior class, has been enrolled in the University School since the four-year kindergarten. He is superior in intellectual ability (I.Q. 142 on the Binet given him in first grade and 143 on the Wechsler, in the eighth grade), and the reports of his teachers are quite consistent in acclaiming his academic achievement, his industry, and his success in human relations. Reports from the elementary grades depict a friendly, responsible, relaxed and happy child, already moving into an unobtrusive leadership role. His work habits were excellent, work in special areas (such as music, shop and physical education) all brought excellent reports, and his academic progress in all areas was well above average.

Jack's most outstanding work in high school has been in the science area. In tenth grade he covered high school biology, chemistry and physics. He was at the top of his biology class, "a near paragon in the eyes of his peers." His research project received a "superior" rating in both District and State Science Day. In chemistry he showed an excellent theoretical background, and his contributions to class discussions were "exceedingly profound." He spent much time with library and laboratory research projects, and one project which was submitted in a national contest was the only one from the mid-west region to receive both a regional and national award. Realizing his need for physics before doing advanced work in chemistry, he undertook to cover the usual high school physics course in before-school private sessions. He placed at the 98th percentile on the standardized final examination in physics.

In eleventh grade Jack has been enrolled in a college freshman level zoology course. These instructors report that he twice received the highest grades made on departmental examinations. They describe him as quiet, unassuming, thorough, having good scientific curiosity, and working consistently and hard. Jack's achievement in mathematics is also quite high. On the basis of this high achievement through eighth grade, he was placed in Algebra II in ninth grade. In Algebra II, Nature of Proof and Advanced Mathematics his achievement has consistently been high. His seriousness of purpose and industrious work habits receive consistent comment in this area too.

In language arts, Jack has shown great improvement. Whereas he formerly tended to restrict his reading to material of a scientific nature, he now reads widely and variedly. Largely through his excellent work in the English Seminar, his writing has shown considerable development both syntactically and semantically, and his aesthetic concepts have matured greatly. Jack's two years of French were very successful. He tended to make minor errors, due to his haste in efforts to speak and write fluently. The teacher declared that rarely had he seen a boy use so much ingenuity as Jack did when he prepared for the dance which he did at the French banquet. Earlier in the course, however, he felt that Jack's spontaneity was carried a bit too far in his unsolicited humorous remarks during class.

Jack's junior high school work in both Related Arts and Home Arts was up to his usual standard of quality, in skill, work habits and product. In typing both concentration and coordination developed rapidly, and he did especially well at organizing his time. His most notable progress in the World Cultures class was in his organization of social studies data into meaningful form. Although the only member of the class below tenth grade level, he was one of the most mature individuals of the group in his responsibility, work habits and achievement standards. Sometimes, however, according to his teacher, his attitude was almost too serious, as if he never fully relaxed or stopped worrying.

Jack has carried a very full schedule of activities, too. He lettered in football his freshman year, and has been selected captain for next year. He is on the track team. In these sports and in physical education classes the instructors consistently note his cooperative attitude, hard work, self-directed practice and mastery of fundamental skills. In addition to athletic activities, he has served as class president and school treasurer (at which he worked very conscientiously and creatively this year). Next year he will serve as president of the Student Council.

Jack's over-all average on the check list of some significant indices of talent was 3.8. He received the highest possible average (4.0) in the science area. The lowest average rating he received (3.5) was in French. Other average ratings were also quite high—core, 3.9; physical education, 3.9; mathematics, 3.7.

Jack is exceptionally skillful in organizing his time and energy in order to do the job that faces him at the moment, as well as in longer range planning. He uses his time well, always works to capacity, is prompt, pleasant and cooperative. Because of his executive and organizational ability, the class turns to him for leadership, often for difficult jobs. He carries through effectively in his leadership responsibilities, although he has a slight tendency to ignore valid criticisms of the plans he announces. Although Jack's strongest academic area is science, he seems to excel in any field of endeavor which he attempts. This is also noted especially in leadership in human relations and athletics. He is a very serious-minded, cooperative, and industrious worker.

CIA. Cia, an eleventh grader, is one of the most creative students currently enrolled in the high school. (Her I.Q. as measured in the fourth grade on the Wechsler Intelligence Scale for Children is 131.) Reports from the elementary teachers indicate early evidence of unusual creativeness. This was manifest in her vivid imagination and unusual ability in music, dramatics, story telling, and creative writing. She improvised at the piano, accompanied herself in singing ballads, wrote imaginative stories fascinating to both children and adults, and was frequently called on for help and ideas in designing, painting, and sketching. Throughout the elementary grades she advanced rapidly in reading speed and comprehension, number concepts, computational skill, and oral and written expression. Her performance in physical education was average. She was developing quite a sense of humor. In much of her work neatness and accuracy were sacrificed for speed. She was described as friendly, cooperative, and generally a good group member. She always behaved maturely for her age, being quite independent and spontaneous in action and thought. In the early grades she tended to dominate her peers and resisted adult suggestions or criticism.

Many of the above-noted characteristics such as creativity, academic achievement, sense of humor, and disregard for details carried over into high school. However, her relations with her peers and her response to criticism greatly improved. Cia's achievement in junior high school mathematics was high enough that she spent much of eighth grade working on algebra. This enabled her to move ahead in an accelerated mathematics program. Her tenth grade biology work was outstanding. Test scores reflected a high level of comprehension, and her contributions to class discussion were especially stimulating because of her usual independent thinking.

Foreign Language, however, is an area which her work is especially outstanding. After a successful seventh grade experience in Exploratory Foreign Language, she has taken two years of French in which her work has been "superior". With a talent for language learning, her pronunciation now is near native, and her vocabulary the largest in the class because she makes a serious attempt to learn new words through her reading. She sometimes makes minor errors on her papers, and the teacher has expressed a fear that she is sometimes insufficiently challenged. Cia's language arts skills, in general, are highly developed. She reads omnivorously, exceedingly rapidly, and with good comprehension. Her selections almost always reflect superior taste and discrimination. She has also done some very interesting writing. She has had some difficulty with spelling but this is now improving. She has made very good progress in history, also, expressing herself clearly and logically both in written work and in discussion. She is quick to spot causal relationships, and she brings to bear a critical and informed judgment on historical and current issues. Recently she was selected to participate in the Student Conference on Foreign Relations. As a result of her excellent and effective participation she was selected as second alternate for a $5,000 round-the-world scholarship to the International School of America.

In music and art, also, Cia has great ability. She has shown great sensitivity in singing folksongs, has a good quality singing voice, a good ear for pitch, a sense of design, and a feeling for the emotional and intellectual message. Throughout this music work she has been interested, dependable, imaginative, cooperative and original. In related arts she is described as a mature worker with a rich background and considerable ability. According to her teachers, she shows exceptional feeling for organization and design relationships for someone her age. She also has demonstrated considerable skill and understanding of necessary tools and materials. She did the art work this past year for [illegible], and has been chosen art editor of next year's yearbook.

Cia has a healthy self-confidence. She is well respected by other students, and contributes enthusiastically and effectively to almost every class and/or school enterprise. She has been an active member of the student council, and next year she will serve as vice-president. Her teachers report that she finds it very difficult to say "no", and consequently sometimes over-commits her capacity, thus causing her to be late in fulfilling some of her obligations.

On the check list of some significant indices of talent, Cia's over-all average was 3.1. Her highest average ratings were in [illegible] (4.0) and French

(3.8). The rating in the physical education area (2.5) was her lowest. In history her average rating was 3.6, and in mathematics (3.0). The art teacher commented that "...her follow through is a little less successful than her initial reactions to a problem." Her rating in this area was 3.6, however.

She is well respected, a leader in her class. She is very mature, a well-rounded, self-confident, dependable person, one who is spontaneous and imaginative and she thinks and acts quite independently. She is unusually creative and her achievements in fields such as the language arts (including foreign languages), art, and music have been particularly outstanding.

APPENDIX A

AN APPLICATION TO THE COMMISSIONER OF EDUCATION, OFFICE OF EDUCATION, U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE, FOR FUNDS TO SUPPORT A RESEARCH PROJECT UNDER THE PROVISIONS OF PUBLIC LAW 531, 83RD CONGRESS.

SUBMITTED BY

The Ohio State University
Columbus, Ohio

on

November 22, 1957

Title

The Identification and Development of Talent in Heterogeneously-Grouped Students in a General Education Program at the Secondary-School Level.

The Problem

How can unusual talent be identified and developed in a general education program at the secondary-school level, a program in which students are grouped heterogeneously?

One of the major trends in secondary school curriculum development seems to be toward more extensive provisions for individual differences among students, particularly at the upper levels of ability and talent. This probably is to be expected since providing for individual differences among students have always been the concern of American schools. In recent years, however, the increase in enrollment, which in turn has caused an increase in class size and in the degree of heterogeneity in the school population, has served to focus even more attention on this problem. More important even than the increased enrollment is the present trained manpower situation. The shortage of trained scientists and engineers has led many of our leaders to demand that the high schools do a better job of identifying and training talented youth-especially in the fields of science and mathematics. A variety of plans have been suggested and considerable research and experimentation carried on, but how to provide for the talented is still a vital issue. In this investigation it is assumed that a wide variety of individual differences can be provided for within the regular class groups - that democratic values can be fostered at the same time that the uniqueness of the individual is being developed.

Major Objectives

Phase I (January 1, 1958 - June 30, 1959 - only this phase is covered by the present contract)

1. To develop a conceptual model of talent in adolescence.
2. To identify "indices of talent" that manifest themselves in the behavior of students as they are involved in the general education program.

Phase II (To begin July 1, 1959 - building on the research which is specified in the present contract.)

1. To plan and execute a curriculum, grades 7-12, designed to further the identification and development of these talents conceptualized in Phase I.

Major Hypothesis

Talent can be identified and developed in a general education program in which students are grouped heterogeneously.

Some of the more specific questions to be answered are:

1. What is the unique, relatively integrated "life style" of talented persons?
2. How many persons can be said to be talented?
3. How early can talent be identified?
4. How can talent be developed?
5. Is there a relationship between the presence of talent and social climate?

6. Is there such a thing as unique talent in mathematics? Science? Economics? Etc. How is it recognized?

Procedure

This project would involve the following steps:

Phase I (January 1, 1958 - June 30, 1959)

1. Refining our concept of talent in adolescence
   - a. Synthesizing prior research in child development by University School Staff[1] and theoretical formulations such as those by Mooney[2] and Pepinsky.[3]

     Approximate time to develop a preliminary formulation--six months. At the same time other of these activities (see below) will be taking place.
   - b. Involving core teachers, special-area teachers, and experts from the various disciplines in defining and identifying talent in their fields of specialization; e.g. mathematics, science, art, music, creative writing, human relations, manual arts, and the like.
   - c. Identifying the talented students in grades 7-12 in the University School--utilizing the judgments of core teachers (and others having responsibility for the general education program); direct observation; cumulative records; tests of general intelligence such as the Stanford Binet or Wechsler;

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[1] How Children Develop. Faculty of the University School. Columbus, The Ohio State University, 1946.

[2] Mooney, Ross. A Preliminary Listing of Indices of Creative Behavior. Bureau of Educational Research, 1953, 11 p. (mimeo.) and "Evaluating Graduate Education," Harvard Educational Review. Vol. XXV, No. 2 Spring, 1955, pp. 85-94.

[3] Pepinsky, Harold B., "Productivity in the University" Personnel and Guidance Journal, November, 1956, pp. 134-139.

achievement tests such as the Iowa tests of Educational Development, the SRA Achievement Series, and the California Achievement Tests; reading tests such as the Iowa Silent Reading Tests; interest inventories such as the Kuder Preference Record; personality and adjustment tests such as the SRA Youth Inventory; and other appropriate data-collecting techniques.

There are approximately 200 students in grades 7-12. It is estimated that about one-third will give evidence of having unusual talent.

d. Selecting one or more groups of students for intensive individual study.

e. Studying the students selected in (d)--utilizing clinical interviews and analyses and other appropriate techniques.

f. Developing a conceptual model of talent in adolescence.

2. Idenfifying the "indices of talent" which manifest themselves in the behavior of students in the general education program.

3. Disseminating the findings in appropriate publications and professional activities of the staff at the state, regional, and national levels.

Phase II Projected Plan (To begin July 1, 1959 - building on the research which is specified in the present contract.)

1. Executing, over a three year period, an experimental curriculum for the students in grades 7-12.

2. Checking the findings in several pilot situations in public school systems during the third year of the project.

3. Disseminating the findings in appropriate publications and professional activities of the staff at the state, regional, and national levels.

Research Personnel

1. Project Director
   Paul R. Klohr, Assistant Dean, College of Education, The Ohio State University.

2. Associate Project Director
   Herbert L. Coon, Principal, The University School and Associate Professor, College of Education, The Ohio State University.

3. Associate Project Director and Principal Investigator
   Elsie J. Alberty, Research Associate, The University School and Associate Professor, College of Education, The Ohio State University.

4. Consultants and Advisors
   a. Harold B. Pepinsky, Director of Research, University Counseling and Testing Center, The Ohio State University.

   b. Ross L. Mooney, Coordinator of Research, College of Education, The Ohio State University.

   c. Alfred B. Garrett, Professor of Chemistry, The Ohio State University.

   d. Harold P. Fawcett, Professor of Mathematics Education, The Ohio State University.

   e. Meno Lovenstein, Professor of Economics, The Ohio State University.

   The consultants listed above have all been involved in recent years in cooperative projects with the staff of the University School. The proposal here would build upon this prior involvement.

Facilities

Utilizing the University School situation and the available resources of The Ohio State University would provide:

1. A situation in which significant beginnings have already been made in the study of human growth and development and in the field of general education curriculum research.

2. An experimental group of students, grades 7-12, in a single school setting, a select student group with a wider range of differing talents than is typical of most schools.

3. A highly-trained professional staff to assist in the research.

4. Excellent consultant resources in the college and university.

Budget

January 1, 1958 - June 30, 1959

Category	Federal Funds	O.S.U. Funds
Personnel		
Principal Investigator	$ 9,750	$ 1,625
Assoc. project director		3,656
Research assistants	6,500	2,500
Clerical assistant	3,000	1,500
Special consultants		2,000
Office Supplies and Materials		569
Other (Statistical Service)	315	
Sub Total	$ 19,565*	$11,850
Overhead (15%)	2,935	
Differential Overhead (43% of all salaries less $2,935)		10,193
Total Cost	$ 22,500	$22,043

Estimated Cost by Fiscal Year (July 1--June 30)

Total amount of time required: 1-1/2 years
Beginning: January 1, 1958 Ending: June 30, 1959

	Federal Funds	O.S.U. Funds
Fiscal 1957-58 (6 Mo.)	$ 8,338	$ 7,171
Fiscal 1958-59	14,162	14,872

*This includes the amount required for contribution to University retirement systems.

APPENDIX B

November 28, 1958

As you know, the U. S. Office of Education and the University School are jointly sponsoring a study of the identification and development of talent in heterogeneously-grouped students in a general education program at the secondary level. The major purposes of this project are: (1) to develop a conceptual model of talent, and (2) to identify "indices of talent" that manifest themselves in the behavior of students in the general education program, grades 7-12. A second phase of the study will involve the development of a high school curriculum which will further the identification and development of talent.

Your views concerning the nature and identification of talent were very helpful to us in getting underway last year. And, we hope that we will have an opportunity to talk further with you as we continue our work on the development of a conceptual model of talent. At this point we are concerned with how the unusually talented individual relates himself to the situation, that is, how the unusually talented individual handles himself in the situation(s) in which his talent is manifest. We need behavioral descriptions of individuals who are unusually talented in various fields of knowledge and/or areas of human activity.

Would you be willing to describe the behavior of individuals in your field of specialization whom you consider to be unusually talented? What do these individuals do? How do they act? A sheet on which you may describe "talented behavior" is enclosed for your convenience.

Sincerely yours,

Elsie J. Alberty
Associate Project Director
and Principal Investigator

THE IDENTIFICATION AND DEVELOPMENT OF TALENT IN THE HIGH SCHOOL

A Project Sponsored Jointly by
The U. S. Office of Education and The University School

NAME

FIELD OF SPECIALIZATION

Please describe the behavior of the unusually talented individual in your field of specialization. What does he do? How does he handle himself in the situations in which his talent is manifest?

> Be as specific as possible. Make as many statements as you feel are necessary to describe the behavior of the unusually talented individual.

1. The unusually talented individual______________________

2. The unusually talented individual______________________

3. The unusually talented individual______________________

4. The unusually talented individual______________________

5. The unusually talented individual______________________

(See other side)

6. The unusually talented individual_ _

7. The unusually talented individual_ _

8. The unusually talented individual_ _

9. The unusually talented individual_ _

10. The unusually talented individual_ _

Additional Comments:

Return to:
Elsie J. Alberty
Room 8, University School